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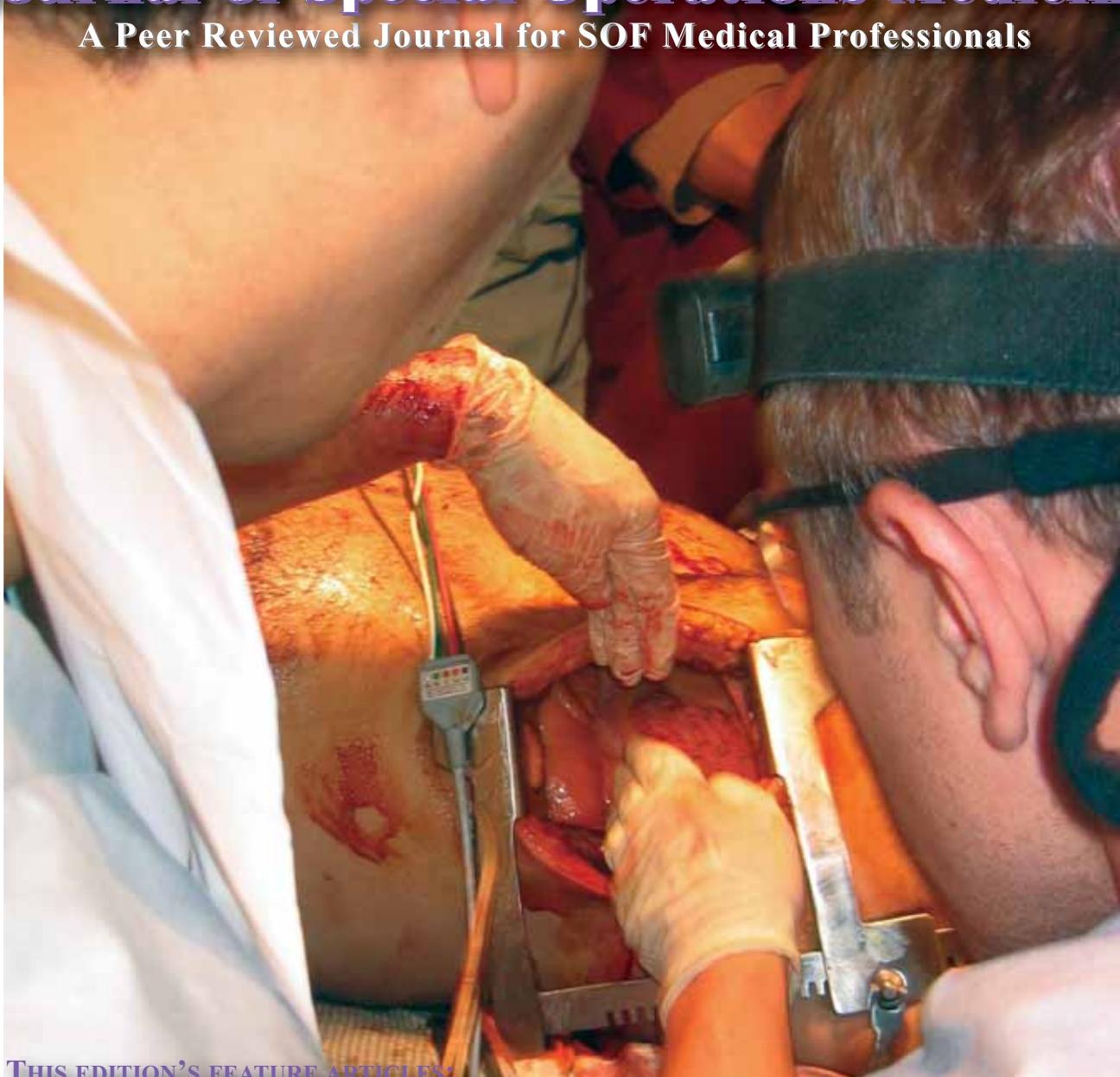
Journal of Special Operations Medicine

A Peer Reviewed Journal for SOF Medical Professionals

Volume 7, Edition 4 /Fall 07

Journal of Special Operations Medicine

ISSN 1553-9768



THIS EDITION'S FEATURE ARTICLES:

- An Unconscious Diver with Pulmonary Abnormalities: Problems Associated with Closed Circuit Underwater Breathing Apparatus
- What Every SOF Medic Should Know about Agroterrorism
- A Novel Application of Hydrogel to Improve the Asherman Chest Seal® in a Deployed Environment
- Joint Special Operations Task Force - Phillipines (JSOTF-P) Joint MEDCAP Planning
- Use of Unapproved Products, Off-Label Use and Black-Box Warning... A Variation of Newton's Third Law or the Practical Application of the Rule of Unintended Consequences... Considerations in Military Operational Medicine

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COVER

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The cover photo is that of a male with a single gunshot wound to the sub-xiphoid region without an exit wound. The focused abdominal sonography for trauma (FAST) revealed what was believed to be large amounts of pericardial blood and clots. When he lost his vital signs, the emergency physician (right) and surgeon (left) (both SOF physicians) performed a resuscitative thoracotomy which demonstrated massive amounts of pericardial fat, but no blood (a false positive FAST). Exploratory laparotomy revealed a catastrophic suprahepatic inferior vena cava injury and the patient did not survive.



Photo compliments of Eric C. Bruno, MD

From the Editor

The Journal of Special Operations Medicine (JSOM) is an authorized official military quarterly publication of the United States Special Operations Command (USSOCOM), MacDill Air Force Base, Florida. The JSOM is not a publication of the Special Operations Medical Association (SOMA). Our mission is to promote the professional development of Special Operations medical personnel by providing a forum for the examination of the latest advancements in medicine and the history of unconventional warfare medicine.

JSOM Disclaimer Statement: The JSOM presents both medical and nonmedical professional information to expand the knowledge of SOF military medical issues and promote collaborative partnerships among services, components, corps, and specialties. It conveys medical service support information and provides a peer-reviewed, quality print medium to encourage dialogue concerning SOF medical initiatives. The views contained herein are those of the authors and do not necessarily reflect the Department of Defense. The United States Special Operations Command and the Journal of Special Operations Medicine do not hold themselves responsible for statements or products discussed in the articles. Unless so stated, material in the JSOM does not reflect the endorsement, official attitude, or position of the USSOCOM-SG or of the Editorial Board.

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Distribution: This publication is targeted to SOF medical personnel. There are several ways for you to obtain the Journal of Special Operations Medicine (JSOM). 1) USSOCOM-SG distributes the JSOM to all our SOF units and our active editorial consultants. 2) SOMA members receive the JSOM as part of membership. Please note, if you are a SOMA member and are not receiving the subscription, you can contact SOMA through www.somaonline.org or contact MSG Russell Justice at justicer@earthlink.net. SOMA provides a very valuable means of obtaining SOF related CME, as well as an annual gathering of SOF medical folks to share current issues. 3) For JSOM readers who do not fall into either of the above mentioned categories, the JSOM is available through paid subscription from the Superintendent of Documents, U.S. Government Printing Office (GPO), for only \$30 a year. Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. GPO order desk -- telephone (202) 512-1800; fax (202) 512-2250; or visit <http://bookstore.gpo.gov/subscriptions/alphabet.html>. You may also use this link to send an email message to the GPO Order Desk—orders@gpo.gov. 4) The JSOM is online through the Joint Special Operations University's new SOF Medical Gateway; it is available to all DoD employees at <https://jsou.socom.mil/medical/>. On the left you will have several tabs; you must first "log-in" using your SS#, DOB, and name; then go to "publications." Scroll down until you get to the JSOM and click on the picture. From this site, you can link straight to the Government Printing Office to subscribe to the JSOM. We are working with the JSOU to have a SOCOM-SG medical site; we will keep you posted as that progresses. 5) The JSOM can also be emailed in PDF format; if you would like to be added to the PDF list please send your request to JSOM@socom.mil.

We need Continuing Medical Education (CME) articles!!!! Remember, our continuing education is for all SF medics, PJs, and SEAL corpsmen. In coordination with the Uniformed Services University of Health Sciences (USUHS), we also offer CME/CNE to physicians, PAs, and nurses.

JSOM CME consists of an educational article which serves to maintain, develop, or increase the knowledge, skills, and professional performance and relationships that a physician uses to provide services for patients, the public, or the profession. The content of CME is that body of knowledge and skills generally recognized and accepted by the profession as within the basic medical sciences, the discipline of clinical medicine, and the provision of healthcare to the public. A formally planned Category 1 educational activity is one that meets all accreditation standards, covers a specific subject area that is scientifically valid, and is appropriate in depth and scope for the intended physician audience. More specifically, the activity must:

- Be based on a perceived or demonstrated educational need which is documented
- Be intended to meet the continuing education needs of an individual physician or specific group of physicians
- Have stated educational objectives for the activity
- Have content which is appropriate for the specified objectives
- Use teaching/learning methodologies and techniques which are suitable for the objectives and format of the activity
- Use evaluation mechanisms defined to assess the quality of the activity and its relevance to the stated needs and objectives

To qualify for 1 CME, it must take 60 min to both read the article and take the accompanying test. To accomplish this, your articles need to be approximately 12 - 15 pages long with a 10 - 15 question test. The JSOM continues to survive because of the generous and time-consuming contributions sent in by physicians and SOF medics, both current and retired, as well as researchers. We need your help! Get published in a peer-review journal NOW! See General Rules of Submission in the back of this journal. We are always looking for SOF-related articles from current and/or former SOF medical veterans. We need you to submit articles that deal with trauma, orthopedic injuries, infectious disease processes, and/or environment and wilderness medicine. More than anything, we need you to write CME articles. Help keep each other current in your re-licensure requirements. Don't forget to send photos to accompany the articles or alone to be included in the photo gallery associated with medical guys and/or training. If you have contributions great or small... send them our way. Our e-mail is: JSOM@socom.mil.

Meet Your JSOM Staff

EXECUTIVE EDITOR

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Colonel “Rocky” Farr was the distinguished honor graduate of his Special Forces 18D class in 1968 and completed 40 years of active service last April. He served as a recon team member with the 5th SFG(A) in SOG-Studies and Observations Group. He attended the DLI (German) and joined Detachment A, Berlin Brigade, an early special mission unit. He became the SF instructor at the ROTC Detachment, Northeast LA University and completed his BS. As a SFC, he taught in the 18D course and was selected for MSG. COL Farr was accepted to the Uniformed Services University of the Health Sciences and while a medical student, he was the medical platoon leader for the 11th SFG(A). He received his MD in 1983 and has completed residencies in aerospace medicine, and anatomic and clinical pathology. He commanded Company F (ABN), 3rd BN, Academy BDE, Academy of Health Sciences as Course Director of the Special Operations Medical Sergeant’s Course; and advisor to the 12th SFG(A). He was Chief, Department of Pathology, Blanchfield Army Community Hospital, and Flight Surgeon, 50th Medical Company (Air Ambulance), 101st ABN Division (Air Assault). COL Farr was the Division Surgeon of the 10th Mountain Division (Light Infantry) until becoming Deputy Commander of the U.S. Army Aeromedical Center. He attended the Air War College before becoming the Deputy Chief of Staff, Surgeon, U.S. Army Special Operations Command; Command Surgeon, U.S. Army Special Forces Command; and Command Surgeon, U.S. Army Civil Affairs and Psychological Operations Command. He became the Command Surgeon of the U.S. Special Operations Command in Tampa, FL in July 2006. He has numerous operational tours to include Bosnia, Kosovo, Kuwait, Vietnam, Cambodia, and Afghanistan.

MANAGING EDITOR

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Lt Col (sel) Landers joined the Army Reserve in 1987 and served as a nurse in a Combat Support Hospital unit for three years before switching services in 1990 to become an Air Force C-130 Flight Nurse. She is currently an IMA reservist attached to the SOCOM/SG office where she has been in charge of management, production, publication, and distribution of the JSOM since its inception in Dec 2000. Lt Col (sel) Landers has a Bachelors in Nursing and a Masters in Business Administration/Management. Her 21 year nursing career includes being a flight nurse in both the military and private sector, 15 years of clinical experience in emergency and critical care nursing as well as being an EMT and a legal nurse consultant. She also served as the military liaison to her Disaster Medical Assistance Team (DMAT). Prior to the SG office, Lt Col (sel) Landers’ experience at USSOCOM includes an assignment in the Center for Force Structure, Resources, Requirements, and Strategic Assessments.

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From the Command Surgeon



WARNER D. "Rocky" FARR
COLONEL, U.S. ARMY
Command Surgeon
HQ USSOCOM



I am starting to write this column as I go out the door to Fort Bragg, North Carolina, for the change of command of Special Warfare Medical Group (Airborne) and then over to the CENTCOM Surgeon's Conference. COL Kevin Keenan, who has expertly run the Joint Special Operations Medical Training Center (JSOMTC) as its Dean since the summer of 2000 will relinquish command of both the schoolhouse (JSOMTC) and the Special Warfare Medical Group (Airborne), an entity that did not even exist when he arrived, to COL Jeff Kingsbury. Jeff once was the 1st Special Forces Group (Airborne), Group Surgeon and has been the JSOMTC Deputy Dean for two years. Our JSOMTC graduates from all components have proved and continue to prove themselves on the many battlefields in the global war daily. We all owe a well done to COL Keenan, his instructors, and his many graduates.

I went up to Fort Bragg recently and administered our USSOCOM Advanced Tactical Practitioner (ATP) examination to the latest class of medics. The JSOMTC is full of students, busy filling the force and the MARSOC Corpsman and SEAL Medics to-be are about to descend in greater numbers. We just had our first MARSOC Navy Corpsman killed, HM2 Luke Milam. CAPT McCartney talks about HM2 Milam more in his MARSOC section. The ATP examination is going very well under the leadership of LCDR Joe Patterson and CPT Scotty Gilpatrick in my training section. I read each and every APT examination that is produced and I think it is maturing nicely. That means I can pass the test when I read it!

The new CENTCOM Surgeon, COL Brian Gamble, recently held his first CENTCOM Surgeon's Con-

ference. We had many of our SOF medical officers there to work on issues in that geographic combatant command's area of operations. It was great to see some former SOF medical players on the CENTCOM medical staff like LTC Harter. It is rewarding to see all this evolve as people get more and more deployments and grow in rank and expertise. We can always use low friends in high places! The SOCCENT Surgeon, COL Bob Noback was there, someone whose position did not even exist when the war started! I am asking the Theater Special Operations Command (TSOC) surgeons to begin writing columns for the JSOM similar to the component surgeons' columns – so look for them to start in this issue. The TSOCs are our war fighting headquarters and we need to hear from them, especially now that medical sections exist. The TSOCs are crucial in developing a more robust Level 2 medical capability to support Special Operations Forces, especially in immature theaters. We are beginning to have some degree of medical expertise out there in war fighting headquarters to try to develop a system of care and evacuation from remote areas. The first SOCPAC Surgeon should be ready for duty in early 2008. After the CENTCOM conference, we all stayed for a SOF breakout / follow-on session and got together with the SOF surgeons and/or medical planners from OIF, OEF, and Horn of Africa (HOA) to work on SOF specific issues. In addition, present for his first look at SOF in CENTCOM was the MARSOC Surgeon, CAPT Steve McCartney.

By the time you get this issue of the Journal of Special Operations Medicine (JSOM), the Special Operations Medical Association (SOMA) Conference will be approaching quite quickly. I hope to see as many as I can at SOMA, operational tempo permitting, of course. The

program at SOMA just keeps getting both bigger and better. One of the presenters, Mr. Justin Barr, who attended last year, is briefing his completed project that we funded, which is a written history of SOF Medics. Please go listen to him and give him pointers to tweak his manuscript, which I plan to use and issue to new graduates. I promise not to be limping at SOMA as I was last year. COL (Ret.) Bob Saum, the SOMA president, is working hard on SOMA arrangements. LTC Bob Harrington is doing his usual excellent job of lining up speakers with a heavy emphasis again on workshop formats and international SOF speakers. See you there.

Each JSOM edition continues to get bigger and better than the last. We will probably put out another training supplement next Spring and we have a Lessons Learned Supplement, in conjunction with the Center for Army Lessons Learned (CALL), coming out around the same time as this edition of the JSOM. We plan to actively collect lessons learned at SOMA and get them into the proper channels to make an effect.

Folks in the field, who, of course, think they get absolutely nothing from their multiple higher headquarters, should start to see some of our new Tactical Combat Casualty Care (TCCC) Medical Acquisition Program Class VIII items being fielded. Remember the “Traveling TCCC Show” that taught and fielded equipment? This acquisition program replaces the equipment fielding portion of that. Training has shifted to a unit-based refresher before deployments, since we’ve all been so many times. A brand new CD is being sent out with the equipment as new equipment training (NET). My intent is not to duplicate service items but to field the hard-to-get / hard-to-find medical items to support how we practice TCCC on the battlefield. LTC Jose Baez is my point of contact and has gotten us money to proceed (see his article in this edition). We will have a meeting during SOMA to discuss the next phase with the component surgeons.

All of the summer general officer changes here in Tampa, at echelons above reality, have occurred. ADM Eric Olson replaced GEN Doug Brown as Commander. ADM Olson in his coming on board remarks and actions has stressed teamwork and physical readiness. General Brown and I were sergeants together in 7th Special Forces Group (Airborne) at Fort Bragg in 1968, he will be missed. The Deputy Commander, who was RADM Olson, is now LTG Kearney from SOCENT and the Director, CSO, is LTG Fridovich, fresh from SOCPAC. Clearly. We have an experienced leadership group fresh from warfighting commands with ideas on how to proceed.

One of the great strengths of our force is our stress on hardiness. Since we have great selection, assessment, and initial training programs in most all components, we begin with a stress hardy individual, well equipped for the rigors of combat. One can say they are “inoculated” against many of the psychological and physiological issues that are both making the newspapers concerning the conventional forces and are currently the focus of the Army’s “Battlemind” program (see <http://www.battlemind.org>) of providing information to all Soldiers on both PTSD and TBI. We actually have physiological data that shows neuropeptide changes in our folks during SERE different from non-SOF personnel – SOF Operators are for the most part a different breed. Nevertheless, regardless of how different we are and how good our original “stress inoculation” was, it is a long war, and we may need booster shots. Having made that medical analogy, I am not sure what the “booster shot” should be – another trip through SERE? I solicit your thoughts on this. How do we keep the force healthy in this long war? You should have noticed SOCM Glenn Mercer’s continuing series of “Human Performance Forums” in the back of the JSOM. We need to work on the psychological side just as much as the physical/physiological side of this large issue. The force you go to war with is the force you have and we need to keep it healthy under these strenuous conditions! ADM Olson is making this a priority of his.

From the Senior Medical Editor



Bob Vogelsang
COL, USA



We got a lot of great stuff from the community for this issue as you will see. Two of this edition's articles are written by some of our enlisted service members. Hopefully, this kind of input to the JSOM will continue and grow. Again, the focus of this publication is on the enlisted member; they are where the meat hits the grinder. What they see and do at point of injury sets the stage for whether that patient will live or die. So, to the Medics, Corpsmen, and PJs who are out there cheating the Grim Reaper by pulling your comrades out of his grasp, please continue to show everyone what you do, and how you do it. You have been there and done that and you have likely found better ways to care for the patient, whether it is the use of a non-standard piece of equipment, or using standard items in a new way. These little gems (that you may not think much of) need to be transmitted to the rest of those who may be in the same situation sooner or later.

As the unit medical provider, please ensure useful medical information gets into all the SODARS and other reporting done by your organization. Yes, there is a lessons learned process on the SIPR and you are encouraged to use it; however, do not feel that the only way to get a lesson learned into the system is by any specific website. We know you don't always have access to SIPR, nor do you always have the time. That's OK, you can submit insights, and/or lessons (good and bad), and general ruminations to us any way you want. You can send things to us by regular mail, NIPR e-mail (digital images highly encouraged when possible), phone call or You Tube (just make sure you clear it with your chain and security personnel). We want to capture all we can learn from you and your experiences as soon as we can, so we can get the good ideas along with the "definitely do NOT do this" experiences out to the community as soon as possible. We know that if you don't write them down and get them out soon after they occur, they will probably be lost forever. So in that light, again, please communicate those epiphanies to us as they come to you.

If you do have access and time, go ahead and submit your lesson learned through the Joint Lessons Learned Information System-SOF (JLLIS-SOF) at <http://205.54.98.3/ussocom> (on SIPR). JLLIS-SOF just replaced the old SOF Lessons Learned Retrieval System (SOFLRS) and we are trying to learn it, but it seems easy enough to input observations, discussions, and recommendations like the old system. You don't have to write a novel, just the pertinent facts and conclusion (i.e., a certain new piece of equipment doesn't work in temperatures over 100° F, etc). Obviously, we would like to see as much useful information as possible in lessons learned submissions, but we'll take the Bottom Line Up Front methodology if that's all you can give us.

To the officers, don't think we have no interest in what you do or what you think. Please continue to send us your fantastic articles. We all learn from them and that is the intent of the JSOM; it is a tool to learn from. We are interested in what everybody does and how they do it. The JSOM is to be a clearinghouse of information useful to everyone in the community. Not everyone scans the SOFLRS site nor do they always paw through AARs. We get that, which is why we feel so strongly about the JSOM and its usefulness as a relatively up-to-date means for everyone to learn about what everyone else is doing.

And to the veterinary folks out there, send in an article for crying out loud. I know you have done some cool stuff (or are you just embellishing your stories at our OPD sessions?). Some of you probably have more college than some of the docs out there, so I know you can write complete sentences. Same for you dental personnel, environmental/preventive med types, loggies, and anyone else providing medical support — you're not off the hook either.

Looking forward to a great SOMA conference and an even better Winter 2008 edition of JSOM (Scotty is thinking about putting sudoku puzzles or a fashion supplement in that one — I was thinking we should start smaller with maybe a placemat type maze or maybe a "Where's Rocky?" game).

ENLISTED CORNER



SENIOR ENLISTED MEDICAL ADVISOR (SEMA)
SOCM GLENN MERCER



This last quarter saw several precedents in the Surgeons Office. We were able to finally conduct a unified meeting between the USSOCOM Medical Requirements Board (RB) and the Joint Medical Enlisted Advisory Council (JMEAC). For over three years these bodies worked and functioned independently from each other. At the 2006 SOMA Conference, it was proposed that because these two entities not only dealt with similar topics they should in fact be formally linked and function in a linear fashion. After some deliberation this course of action was selected and subsequently acted on over the summer.

From this inaugural, we were able to set the following standard operating procedures in place. 1) The two bodies will meet collectively twice a year (Aug and Dec); 2) The RB will table and conduct business prior to the collective assembly; and 3) The RB will pass all formal business through the JMEAC for review, action endorsement, and development of position statements. This will allow and provide us with a unified voice when articulating business to the chain of command. The current membership of both bodies is approximately 35 SOF personnel and two technical advisors.

The first item that was in arrears was the US-SOCOM Critical Task List (CTL) which had not been updated since its creation in 2004. As this is truly the unifying document for our claim of adhering to joint interoperable standard, it was critical that we not only consider the process of declaring it current, but also conduct a detailed content review as well. This subsequently resulted in the State of the Union on the SOF Combat Medic. I am pleased to say that from an operator, line

leader, and unit physician standpoint everyone is satisfied with the competency of our Force on the battlefield. The after action reports that come to this office continue to impress the leadership with the ability of these Operators to deal with unusually complex cases with minimal resources.

Presently the CTL is edited to a smooth status and ready to be delivered to the SOCOM Force Surgeon and Chief of Staff for their signature. Changes from both boards were minimal and the document appears to be doing its job, as reconciliation with the present educational facilities master training topics revealed little disparity over a two year period. The hottest topic was emergency dental capabilities. This requirement seems to have had a historical ebb and flow over the last decade as we saw a re-emergence of the need for the skill set on Operator AARs from the Skill Sustainment Course. This is an example of how we utilized the precepts for the combined meetings. Potential changes have to be supported or demanded from the claimancy as opposed to one individual unduly influencing the agenda.

After review of a recent senior physician's editorial in a past JSOM declaring how important it was to be a good doctor above anything else, the JMEAC focused on several core issues this meeting cycle. It was attended for the first time by the Chief of the Navy Hospital Corps, Force Master Chief Elliott. The topic that consumed the most time was the strategic manning concept of career fields for medical service corps officers in Special Operations. Presently there is no policy or institutional directive that allows, provides, or delineates a cradle to grave career path in either the SOF Service

components or MFP-11. From the SNCO viewpoint this is, and continues to be, the most significant weak point of our community. This problem is not only aged, but worsening as we grow larger from PDM, POM, and QDR inflow. Our most senior personnel across the force that are charged with establishing mission and vision usually have no direct or recent community experience. It is an even more infrequent occurrence that they have had line leadership experience at any time in their career history. The situation today is status quo, as we have field grade medical officers drafting, enacting, and enforcing policies that directly impact Operators and career Medics. This is usually successful when dealing with baseline medical tradecraft and the de-centralization of medical care. However, this manning policy has begun to show larger liabilities when compared to other decisions that are made outside of this defined area of expertise. Manning and enlisted career field decisions are a pre-eminent example.

It is time to consider not just the acquisition, but also the growth of our own personnel. Several options have been developed by SNCOs in the last year, but the concept that appears to have the most merit is that of a secondary or alternate identifier specifically for medical and service corps officers that have not just served, but have been qualified and vetted after a first tour in SOF. The canvas after this entry point is wide open for ideas; however the precepts to having a quality manning concept are fundamentally the same as the Line.

- Our senior leaders must have experience in this community to make decisions for this community. Our present SOCOM Commander has over 25 years of experience in Special Operations; we should have a better standard than “none required” for our medical leaders.
- Our future leaders cannot be transients as junior officers. Any staff tour in a SOF unit needs to be three or more years, with a prescribed path for return. Performance in our organization needs to have equivalency standards that are recognized at the Bureaus of Medicine, selection boards, and by the senior raters across the chains of command.
- Our senior leaders must be accountable to their constituents. Presently a medical officer is both performance appraised and peer reviewed as a physician and reported on as an officer. There are no systems of QA or success metrics for the unique and specialty leadership skills required in the archetype of SOF Surgeons. Doctrinally, a Command Surgeon is the executive advisor to the commander, a low frequency practitioner, and a functional leader of specialized troops. The leadership demands in

SOF require our Surgeons and subordinate physicians to be competent in these areas but also savvy in manning, acquisitions, deployed operations, preparation of strategic concepts, requirements, legislative affairs, staffing actions, prepotency, and executive management. These topics are just foreign to those born and bred from the military medical infrastructure. Competency in these venues is not conferred by attending an “indoctrination” course of instruction. Accountability starts with trust, candor, and reciprocity. These traits that foster accountability cannot be implemented when our officers are not vested.

In 20 years I've only been exposed to one poor physician; however, in that same time I have witnessed and worked for several exceptional doctors who were absolutely paralyzed by poor decisions and utterly constrained by ignorance of the situations they faced. For those that would read this and say it just can't be done, I submit that it already has been done in more than one Service, just not specifically for Service medical officers. As long as the status quo remains we will employ senior leaders that are nominated and detailed by the buddy system and subsequently set them up for failure by limiting their tours, basing their advancement on zero defect precepts, rating them using Bureau of Medicine standards, and forcing them to keep pace with peers who are grinding it out to be future administrators of the TRICARE system. We need to establish SOF Medicine, or for that matter “expeditionary medicine,” as something that is not our Achilles heel but is a representative of the excellence in this organization. It needs to exist as a rated sub-specialty in the personnel systems. At a minimum, we need the ready ability to look into a file and establish in an objective capacity if a candidate meets requisites and milestones to be a FORCE leader or OIC of direct support assets. Considering that our criterion for commissioned line leadership in SOF becomes more stringent the further you ascend, why would we have existed this long in a system where the only tangible requisite to SOF assignment is that you must be a graduate of a medical school.

This quarter, Navy Senior Chief Raul Morales checked into the Surgeons Office to serve as an action officer for several of the JMEAC's strategic projects and initiatives. His primary assignment is to capture the joint mission essential tasks and to articulate them in SOF publications. In this capacity he will liaise significantly with the SOCOM and Components' J7 sections. Ultimately, we want to see the Surgeons Critical Task List become the J7 Mission Essential Task List. Welcome aboard Raul.



Dalton Diamond, MD
COL, USA
Command Surgeon

USASOC



When I wrote this column for the Summer 2006 issue of JSOM, I said it would be the only time I would do so. Oops! Instead I should have mimicked the Governor and said, "I'll be back!" COL Caravalho has returned to Big Army and we wish him well.

What's going on in USASOC? With all the recent emphasis on minimal traumatic brain injury (mTBI), post traumatic stress disorder (PTSD), and the Department of the Army message released in July, we are in the midst of the initial round of mandatory training for all Soldiers, AC, and RC, on mTBI/PTSD. This training is to become a routine pre-deployment/post-deployment requirement and likely an annual event as well. USASOC efforts are spearheaded by LTC Bob Forsten, the recently assigned USASOC Psychiatrist.

September 11-13 we conducted our annual Special Operations Medical Indoctrination Course (SOMIC) with twenty students representing both Active and Reserve Components. As usual, the course was well received and LTC Jim Czarnik and his team did a masterful job of putting the course together. The highlight of the week was a "gee whiz" presentation from COL Geoffrey Ling and others from the Defense Advanced Research Projects Agency (DARPA). Because of the importance of DARPA in being able to translate raw ideas into practical tools in record time, we have invited COL Ling to reprise his traveling show at the USASOC Surgeon's conference preceding SOMA this December. I want all of you to hear this presentation, so that you will be stimulated to bring forth ideas and ask for things you find you

need on the battlefield that require a technology solution. Between DARPA and the USSOCOM Biomedical Initiatives Steering Committee (BISC) we have a tremendous ability to push scientific frontiers in the direction of preventing illness, mending injuries, decreasing disabilities, and saving lives. The final comment on SOMIC is that we are investigating the possibility of obtaining Continuing Medical Education Credit (CME) for SOMIC next September and adding some specific medical content – high altitude and hyperbaric medicine, for example – to the course.

On another front we are working with the other Component Surgeons and USSOCOM to figure out how to ensure we have adequate far forward resuscitative surgical capability when we need it. And, by the way, we need it now. As COL Farr stated in his editorial from the Summer 2007 issue of JSOM, we have a bad habit of cobbling together whatever is required so that we do not fail. In the end, perhaps, that causes us to compete poorly for resources. CAPT Sourbeer, in his column in the same issue of the JSOM, talks about this capability gap. We have some initiatives going with the Sustainment Brigade at USASOC and are reaching out to Big Army in an effort to get the necessary force structure authorized and then get the slots filled.

We are pleased to have LTC (P) Pete Benson on board as the Command Surgeon for U.S. Army Special Forces Command (USASFC). He and his Operations NCO, MSG Oscar Ware, are the vanguard for creating a USASFC Surgeon's Office as a separate entity from US-

ASOC. Pete feels right at home since he just completed an assignment at Special Operations Command Europe (SOCEUR), where he was charged with standing up the first ever Theater Special Operations Command (TSOC) Surgeon's Office.

October 1st COL Kevin Keenan, who has been at Ft. Bragg even longer than I have, passed the reigns of command of the Special Warfare Medical Group, and Deanship of the Joint Special Operations Medical Training Center (JSOMTC) to COL Jeff Kingsbury. Kevin leaves a lofty legacy of success in vastly improving the professional con-

tent of the courses taught at the JSOMTC as well as structural changes which have increased throughput, decreased time lost in recycles, and generally made the school house run more efficiently. The entire joint special operations medical community is indebted to Kevin for his accomplishments on behalf of our SOF Medics and the Soldiers, Sailors, Airmen, and Marines for whom they provide care.

Our office will have a big turnout for the USASOC Surgeon's Conference and SOMA and we look forward to seeing all of you in Tampa.

Sine Pari!



ALARACT 214/2007 Hemostatic dressings and Quikclot, dtg 271332z SEP 07. Hemostatic dressings are part of the treatment for traumatic hemorrhage. Recently developed hemostatic dressings tested and fielded by the Army include a chitosan-impregnated dressing produced by Hemcon, Inc., and Quikclot hemostatic powder produced by Z-Medica. Both have FDA approval. Due to an increased incidence of thermal injury from the use of Quikclot, this ALARACT reiterates that the safer Hemcom bandage must be the first hemostatic dressing used for hemorrhage control. See the message for more specifics.

This message has been sent by the pentagon telecommunications center on behalf of DA Washington DC//DASG-HR//DAMO-DASG// this ALARACT message is being sent out on behalf of the acting Surgeon General.

Subject: Hemostatic Dressings and Quickclot

1. (U) Hemostatic dressings are part of the treatment for traumatic hemorrhage. Recently developed hemostatic dressings tested and fielded by the Army include a chitosan-impregnated dressing produced by Hemcon, Inc., and Quikclot hemostatic powder produced by Z-Medica. Both have FDA approval.
2. (U) Guidance.
 - 2.a. (U) The committee on tactical combat casualty care (COTCCC) in JUL 04 recommended the following guidelines for hemorrhage control:
 - 2.a.(1) (U) Apply pressure, pressure dressing, and tourniquet.
 - 2.a.(2) (U) If bleeding persists, apply Hemcon.
 - 2.a.(3) (U) If bleeding persists, remove Hemcon and apply Quikclot with pressure for 5 minutes.
 - 2.b. (U) Due to an increased incidence of thermal injury from the use of Quikclot, this ALARACT reiterates that the safer Hemcom bandage must be the first hemostatic dressing used for hemorrhage control.
3. (U) As the Hemcon dressing is safe and has no known adverse effects, this should be the first hemostatic dressing used in situations in which severe external bleeding cannot be controlled by standard methods. Due to possible thermal injury, Quikclot should be used only in life-threatening situations in which the care provider determines that the risk is worth the potential benefit. In such circumstances, as much blood as possible should be removed from the site of injury before application, to minimize damage to surrounding tissue. Quikclot should only be used by trained medical personnel (providers, combat Medics).
4. (U) All efforts should be made to ensure that Hemcon dressings are available at level one and higher levels of care so that it will not be necessary to expose patients to the thermal risks associated with use of Quikclot.
5. (U) POC: COL Kathy Harrington, e-mail: kathy.harrington@amedd.army.mil, com: 210-221-7879, DSN: 471-7879.
6. (U) Expiration date cannot be determined.

COMPONENT SURGEON



Timothy Jex, MD
Col, USAF
Command Surgeon

AFSOC



It's been six years since 9/11 and six years since Special Ops went into surge mode. Sometime not too long after that surge began, it became clear that the old "surge" mode was now the new sustainment mode, and this required each of us to commit ourselves to a long-term level of sacrifice and performance that most of us had never envisioned. That commitment to the mission, however, is the true strength of AFSOC medicine. Yes, it's true that more money, more toys, more training, more flexibility, etc. help make us high-speed and special, but it's really the individual commitment and motivation that make us so effective. As I visit our various units, that commitment is very obvious in every medic I talk with. It is also clear, however, that some of the decisions made and processes established under the pressure of circumstances of some time past have become deeply ingrained without much subsequent reassessment. If you haven't done so lately, I'd ask each of you to take some time to rethink and re-assess how you're taking care of the mission – both individually and as a unit. Circumstances contin-

ually change and this means opportunities come along frequently to do things smarter and better. Let's make sure we recognize and take advantage of them.

On the subject of change...I just attended the ceremony transferring Cannon AFB in New Mexico from Air Combat Command to Air Force Special Operations Command on 1 October 2007. Over the next few years, the 27 SOW at Cannon AFB will continue to grow and eventually closely mirror the capabilities currently in the 1 SOW at Hurlburt Field. This opportunity for wing mitosis synchronized well with the recent QDR and the greatly increased demand for AFSOC capabilities in the war on terrorism. Our new base is extremely well-suited to AFSOC requirements and I've never seen a community more supportive of its base than Clovis. In fact, I've got a truly great story about community support there that I'll share over a drink sometime... maybe at SOMA.

And just in case you forgot, I expect every one of our medical units to be presenting something during the SOMA conference this year! See you there.

COMPONENT SURGEON

NAVSPECWARCOM



Jay Sourbeer, MD
CAPT, USN
Command Surgeon



“Today is a great Navy day!” Something we don’t often start an article in this forum with, but it truly is a great day.

The Change of Command at Naval Special Warfare’s headquarters bid farewell to a magnificent leader, Rear Admiral Maguire. We now have the distinct pleasure in hailing Rear Admiral Kernan as the new Commander of Naval Special Warfare. The two Admirals were both promoted and wear an additional star on their collars. Rear Admiral (lower half) Gary Bonelli has stepped in and taken the Deputy position and is prepared to take NSW to the next level.

“BRAVO ZULU Group THREE”

Congratulations to the medical personnel from NAVSPECWAR Group THREE for their unwavering success on their medical assessment, demonstrating the superb comprehensive medical support, which they are delivering to our community. They also provide the proper credentialing and mentoring of our physician assistants, physical therapy programs, and physician extenders. We will be visiting other groups in the near future with high expectations on their performance.

We have just had our first injured Warrior enter the C5 program through the Naval Medical Center San Diego (NMCSD), and with excellent planning the program is off to a great start. The C5 program directors

also began outsourcing with the local hospitals for outpatient rehabilitation. SOF Warriors are always on a mission, whether it is to capture or kill the enemy or to push themselves to the degree necessary to recover from injuries incurred in battle.

A recent tour of the new C5 facility shows tremendous promise to the success of their program. A grand opening will occur on 15 October 2007, and everything from their prosthetics department to their contoured courtyard appears to be nothing short of spectacular. Their staff has given 100% in the preparation of this facility and will continue to provide care to our wounded with state-of-the-art-equipment.

Complimenting the rehabilitation of our warriors we can’t forget the growing population of physical therapists, physical therapy techs, and certified athletic trainers, who are providing outstanding care to our injured Operators and getting them back in the fight as soon as possible. Their efforts yield high rewards from our troops as they continuously prepare for deployment. We look forward to their development of new technologies and greater success of our recovering forces.

Local training is being conducted for our civilian and military staff members in CPR, and we have strategically installed automated external defibrillators (AEDs) throughout our facility; some of the staff are concerned about our placement of these AEDs. Our junior staff personnel (of which we yield two) have been taking a break from their daily routine, getting out of the

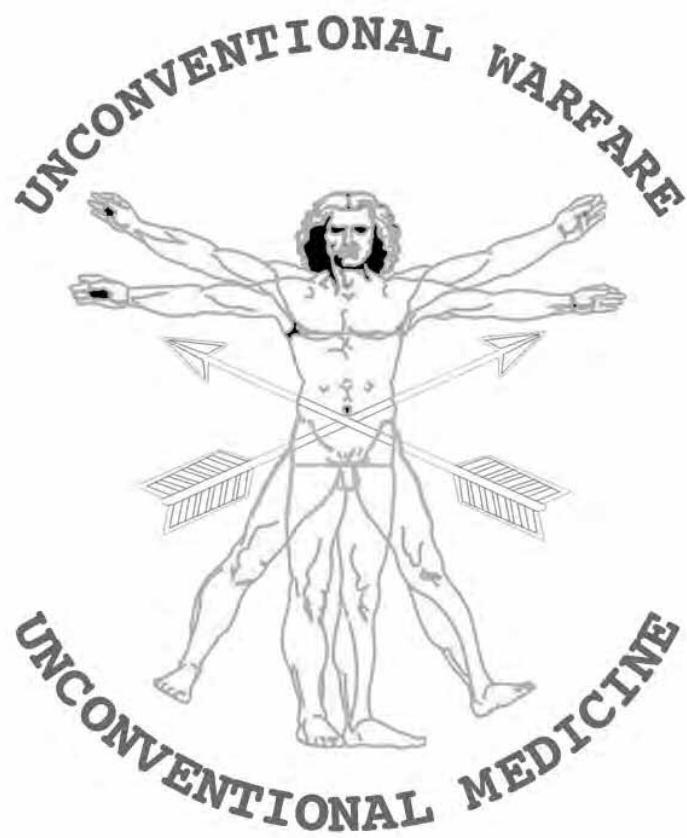
office and providing medical coverage for weapons testing at the desert training facility here in southern California, demonstrating to our junior personnel how our training environment closely matches that of our current operational environment.

The Naval Special Warfare Training Center broke new ground on their barracks and medical facility. This new structure will house the student population as well as the medical clinic, building up into the beautiful Coronado skyline and accommodating physical therapy, rehabilitation, radiology, sickcall spaces, and a physio-pool.

We have just received our first shipment of SOF Sustainment, Asset Visibility and Information Exchange (SSAVIE) Tactical Casualty Combat Care (TCCC) equipment and issued it to our deploying forces. The Special Op-

erations Forces Support Activity (SOFSA) personnel were a tremendous help in acquiring the access, acquisition, and delivery of this equipment, and the future looks promising for continued support and success. The TCCC integrated product team (IPT) has done an amazing job organizing and executing the process and the equipment to meet the needs of the SOF Warrior Medics going down range. We are always looking for new equipment, new ideas, and new methods to make their job more valuable.

It takes a special breed of character to go into the Special Forces and even more to become a SOF Medic. Thank you all for doing such an outstanding job caring for our wounded Warriors in and out of combat. We will continue to support our strongest and most valuable weapons system ... the human system.



COMPONENT SURGEON



Stephen F. McCartney, MD
CAPT, USN
Command Surgeon

MARSOC



As Command Surgeon of MARSOC I am most pleased to contribute to this issue as it is a chance to deliver on what I promised when I came aboard 14 months ago. That promise was to chronicle the building of MARSOC as well as its medical support. I am glad to report that we continue to make planned milestones as the newest SOF component to USSOCOM.

What is most unique to our journey is that there was never a honeymoon. As Marine Corps ethos dictates, and as many of you predicted, we have been in the fight from the get go, via the Special Operations Battalion's Direct Action Special Reconnaissance (DA/SR) as well as the many Marine Special Operations Advisor Group FID missions already accomplished from the beginning.

We deployed the Alpha Company with the West Coast Marine Expeditionary Units (MEU), and as I write this piece, they are still afloat in the CENTCOM AOR. Fox Company returned from its seven-month deployment in July and Golf Company is currently engaged in the fight. Our Special Amphibious Reconnaissance Corpsmen (SARC) as well as assigned Field Medical Corpsmen (NEC 8404) have performed exceedingly well in two AORs. SOCCENT leadership has singularly praised the performance of Alpha Company in its recent OEF mission. Having seen the official reports and damage inflicted on the enemy I say a respectful "Bravo Zulu". Sadly, a most regrettable medical milestone also occurred with the combat death of HM2 Luke Milam (DV/PJ) USN of Golf Co., 2d Marine Special Operations Battalion in Afghanistan. Combat-decorated HM2 Milam was

MARSOC's first (2006) "Operator of the Year" and duly recognized as such by Major General Hejlik last February. He was buried by a grieving family and a sad but thankful nation in October.

I am sad to see the departure of MARSOC's true friend Colonel Kevin Keenan, Dean, Joint Special Operations Medical Training Center at Fort Bragg. Colonel Keenan and recently retired Vice Dean, Colonel "Butch" Anderson, always welcomed me and my staff; we will always appreciate their advice and assistance to MARSOC as we snapped in last year. Welcome aboard Colonel Kingsbury!

As we speak of this I am encouraged that our long-awaited increase in U.S. Navy seats at JSOMTC has been acted upon wisely by its Executive Agent. With the standup of MARSOC and NAVWARCOM needs as well, the substantial increase in allocated annual USN SOCM seats will provide for the needed growth and readiness needs of both of the Navy SOF Medic communities. MARSOC thanks all who engaged and provided wisdom and support to a most critical need. We will stand by to bring in capable Sailors currently in the pipeline to a school seat at JSOMTC.

The Marine Special Operations School (MSOS) at Stone Bay, NC, has finalized and submitted the curricula and schedule for the individual MARSOC training course for SOF operators. Future MARSOC SARC will proceed through this same package with the goal of achieving the best MARSOF for USSOCOM global missions, interoperability and jointness.

As MARSOC grows, so does the Navy medicine component. I am pleased to have our officer slate manned with the most capable, dedicated professionals I have seen in my 28 years of service. As we “paint the car going 60 miles per hour,” one of my goals is to develop a professional career path for our medical officer professionals who desire to stay within the SOF community longer than current tours allow.

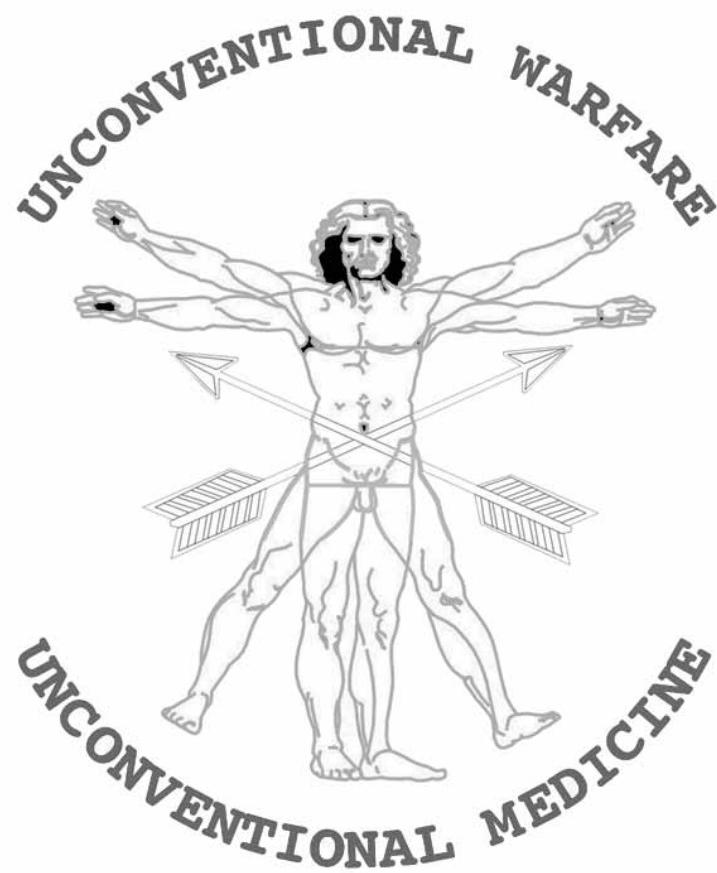
Under the wise guidance of MARSOC Command Master Chief Bill Cherry and our SNCOs, the methodology to allow for longer “career enhancing” Corpsman tours is being brainstormed. The Commandant of the Marine Corps (CMC) has agreed to allow for USMC serving with MARSOC to have five year tours for development and also for MARSOC to get a return on its investment. Our goal is to do the same so the in-

dividual enlisted Sailor will have parity with all the same professional and financial benefits as the Marine he serves shoulder to shoulder with.

We at MARSOC look forward to the Special Operations Medical Association Conference this December. I encourage anyone in our readership to stop any MARSOC Sailor at the meeting and ask questions. I am sure our enthusiasm and professionalism will show. We are doing things differently, by the seat of our pants sometimes, and 99% dogma-free so you may find our answers and experience thus far of unique interest.

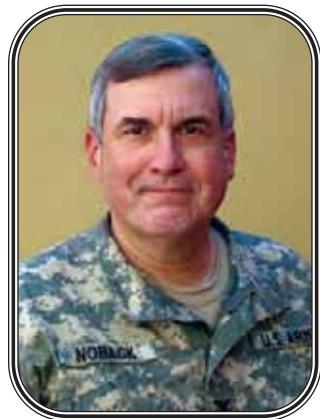
In Memoriam of Hospitalman Second Class Luke Milam (DV/PJ), USN, and his family:

Your family, shipmates, and country mourn our loss of you. May God bless your young, brave, and honorable soul.





Robert Noback, MD
COL USA
Command Surgeon



A couple of months back it was suggested by COL Farr that the TSOC surgeons write a column for the Journal – how hard could that be? Evidently, much harder than I expected. Thinking of ways to approach the subject, I first thought that going into full Hunter Thompson mindset, minus his assorted adjuvants of course, would get me past the writers block. A good theory, but, upon going outside with the laptop, it being a pleasant night in BAF, I was attacked by bats and driven back inside. Fortunately, being in full compliance with my vaccinations I have had the rabies series, so the bats were never in danger, thus reiterating the importance of ensuring everyone is fully up to date before deploying to strange places.

Back inside, I was still getting nowhere, so I decided to download a few back numbers of the Journal and take a look at the sort of things the Component Surgeons were writing about, so there might be some consistency in the tenor of the columns, even if the others were more coherent. Thanks to the wonders of the various IMOs and tenders of the world-wide-wait between here and the states, several days later I managed to complete a download of a back copy of the Journal. Unfortunately, that didn't help much, because in order to truly emulate those columns, I would have to go beyond the vague generalities of the issues of the AOR.

As SOCCENT winds up the sixth year of its involvement in the GWOT, it is beginning only the third year with a dedicated command surgeon and something resembling in function, what a dedicated Surgeon/Med Ops section should look like. The concept and structure are still evolving. This is actually one of our greatest chal-

lenges, and we are not unique; the other TSOCs face the same challenge and all are in various stages of evolution.

As SOCCENT functions at present, there are three essential missions of the SOCCENT medical section: (1) to function as the primary interface between supported SOF medical personnel and the supporting CF medical personnel to ensure adequate support is received by SOCCENT subordinate commands; (2) to function as the primary advisor to the CDR, DCO, all staff, and directorates regarding medical matters germane to the command; and (3) to monitor readiness of the command, to include providing direct health care in both rear and forward locations as needed.

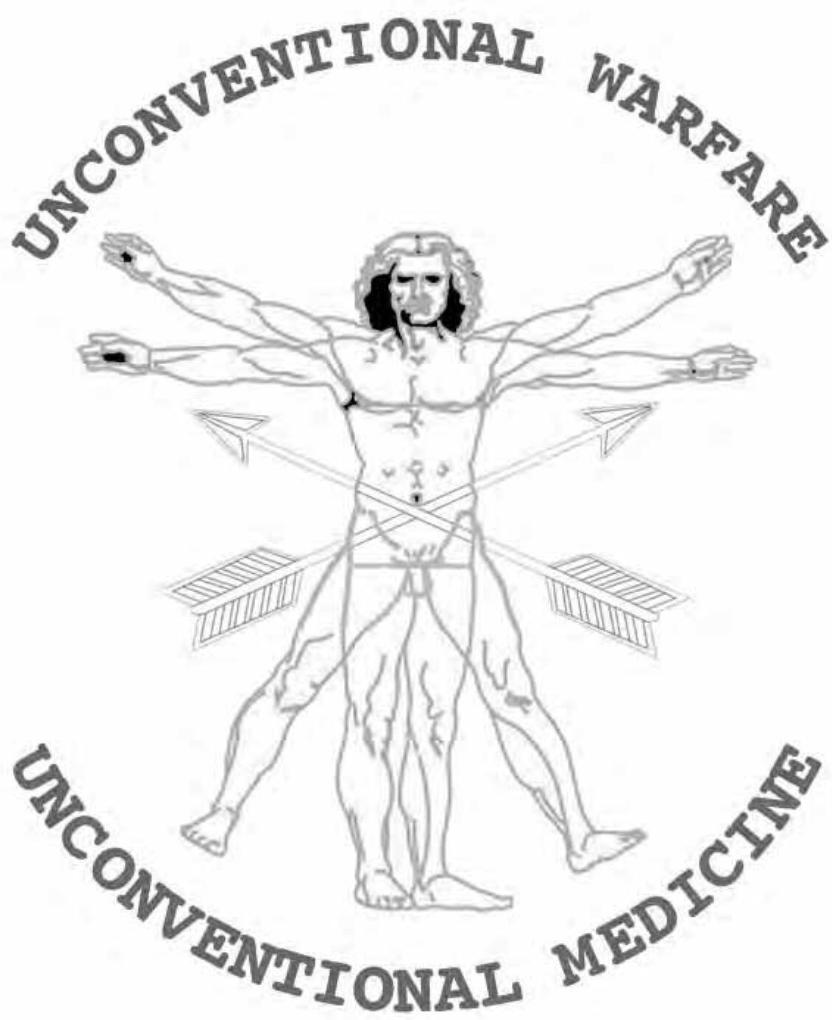
What we think we need consists of a surgeon, deputy surgeon/C, medical plans, physician assistant (former SOF background), and a USAF IDMT senior medical NCO. Additional personnel desired include: an ESO (or BEE or PM doc); two additional PAs; an additional IDMT; and three 68W-equivalent Medics. J4 will retain the medical logistics officer, and medical planner they now have in order to ensure integration of support plans, and to provide continuity across split bases.

If you have made it this far, you are probably wondering what the "so what" is. The so what is that if you are reading this, more than likely somehow, somewhere, you have some kind of interface with a TSOC. As I mentioned earlier, what I consider a primary function, probably the primary function, of the TSOC surgeon/medical operations section is to be a bridge between the CF supporting world and you. Because at this time virtually all solutions to SOF medical support issues are still heav-

ily dependent upon conventional forces, more coordination and lead time is required than for SOF pure solutions, so the better staffed we are, the better we can serve you. The flip side is that we can use your help, the more support we — not just SOCCENT but all the TSOCs —

have from those we support in making the case for a full-up surgeon/medical operations section, the better off we'll all be.

With that, I'll close; I think the bats are back.
Molon Labe





Peter J. Benson, MD
LTC, USA
Command Surgeon



USASFC



I would like to introduce myself as the first U.S. Army Special Forces Command (Airborne), Command Surgeon. I arrived at Fort Bragg this summer after three years in Stuttgart, Germany where I was the Command Surgeon of Special Operations Command Europe (SOCEUR), the European Theater Special Operations Command. The USASFC (A) Command Surgeon's Office has the goal of improving the command and support relationships of Army Special Forces (SF) with regard to medical issues. I am a staunch advocate of the expansion and filling of the Special Operations Forces command medical positions in the Services as well as in the Theater Special Operations Commands. As the Global War on Terrorism (GWOT) continues, supporting the varied nature of our medical mission will require a strong voice and a persistent focus. The USASFC (A) Command Surgeon's Office will work to provide medical direction and advocacy for the Special Forces Groups of the Active Army and National Guard, within the Command and to the higher echelons.

Although the USASFC (A) Command Surgeon's Office has only been recently filled, we have already begun to work toward addressing some medical issues and improving medical support for the Command. There are a number of items that I'd like to address from this office. First, I would like to ensure that the training from the SFMS and SOCM courses are providing the skills and experience necessary for the SF mission. This also means looking toward the future of the GWOT and the ability to field a Special Forces Medical Sergeant prepared to sup-

port the range of UW and FID missions in an austere, far-forward environment. Second, I would like to address the absence of medical capability and doctrine for far-forward surgical care in support of Special Forces. There is a critical gap in the availability of far-forward critical and resuscitative surgical care outside the conventional environment. As the GWOT moves forward, the absence of small, light, and medically agile higher level care for Special Forces will inhibit its GWOT mission. A third issue of interest is maximizing National Guard medical readiness, medical sergeant training and credentialing, and integration for active deployments. Allied to this are some medical equipment issues related to fielding the new medical tactical set. Lastly, professional assignments and staffing of the Groups will be handled by this office. Concurrent assignments in Special Forces or SOF positions to the exclusion of clinical practice or commensurate MEDCOM assignments will not be supported. In the future, Special Forces and SOF will need medical officers with broader staff and Army experience to fill TSOC and higher level staff roles. "SOF-only" careers will leave us "inbred" and friendless with respect to the rest of the Army and MEDCOM.

I hope to be able to meet as many of the Command's medical personnel as possible at the Special Operations Medicine Association Conference in Tampa. With my background in Special Forces and Special Operations medicine I hope to be an active and valuable interface for Special Forces medicine both within and outside the Command.

Education & Training

COL Bob Vogelsang
Deputy Surgeon for Clinical Operations



As you read in the last issue, the Education and Training section got a good shot in the arm with the arrival of some new blood. In very short order, Joe, Scotty, and Diane have really made some progress. Thanks to Steve for providing the info dump to the new crew (more on Steve later). Joe just got the initial draft of a new SOCOM medical education and training directive, which is coming out of the J7 shop as one in their series of training publications. It will be numbered 350 “tack” 29 as Joe calls it. We Army guys didn’t know that a “dash” is called a “tack” in the Navy until Joe got here— something to do with signal flags we think. This pub will take much of what is in the current SOCOM Directive 40-2 and codify SOF medical training, certification, and recertification as a training document.

The significance of this will not be noticed by the SOF Medic, but it actually is a pretty big deal for us here at corporate headquarters. The acknowledgement by the J7 that medical training is a SOF joint interoperable skill gives medical education and training another parent, instead of the single mother that was the SOCOM Surgeon previously. The J7 has the knowledge and the juice to be able to POM (program objective memorandum) for the Command Medic Certification program as an actual program or record. Currently, we have to beg and UFR (unfunded requirement) from the SOCOM Chief of Staff to make it go. It would be much nicer if the J7 could pitch the medical portion, as part of their much larger training program, in front of the ADs, (Assessment Directors – the group of O-6s that decide if you are worthy of funding or not). Surely the ADs would approve, and when done, we’d have money in the bank account each year instead of the annual panhandling that has happened in the past.

Next new issue is Advanced Tactical Practitioner (ATP) certification and recertification. One thing we have recently discovered is that personnel who do not have ATP status have been going to the Special Operations Combat Medic Skills Sustainment Course (SOCMSSC) and receiving ATP cards upon course completion. There have been some folks who have gotten under the radar and possess ATP cards though they have

never been designated as ATPs. First, SOCMSSC is not intended to be simply a course that is nice for Medics to go to for a couple weeks, whether it is because their command wants them up to speed for an upcoming deployment (though there is utility in that) or they just had some time to do it. SOCMSSC is intended to be the only way for an ATP to be recertified, as stated in SOCOM Directive 40-2 (and will be carried through in 350-29 and a future updated 40-series SOCOM publication). SOCMSSC is an ATP sustainment and recertification course; you have to be an ATP before you can sustain ATP certification. Simply completing SOCMSSC does not an ATP make.

USSOCOM released an official message addressing this matter to all components (AMHS message DTG 271311ZSEP07; Subject: Amplification of Command Medic Certification Program. USSOCOM Advanced Tactical Practitioner Certification and Recertification). In summary, the message tells components not to send personnel who are not in the USSOCOM ATP database with an assigned ATP number. It goes on to explain that if the individual never had met requirements to be an ATP, they must submit a request to take the ATP exam, and after passing the exam and completing SOCMSSC, they will receive ATP credentials. Because each Servicemember will have a different set of circumstances, the message delineates no specific information which must be submitted to the SOCOM Surgeon for determination of ATP status. As such, individuals are directed to send all documents they feel are relevant to our office for review. If you have a Medic, Corpsman, or PJ who says they are an ATP, but cannot show a valid certificate or card, call Scotty or Joe here at the SOCOM Surgeon’s Office and they will check the database. It is certainly possible that the individual lost their documentation, but they are in the database. An admonition—just because someone gets into and through SOCMSSC, that does not make them an ATP; personnel who complete SOCMSSC, but do not have the appropriate ATP status, will get some good training, but they will not get an ATP card. This will surely have caused some heartburn as this issue of JSOM won’t actually come out for about 30 to 40 days after I write this. Yes, some people got over and have cards and are in the system. Yes, some of

that culpability falls on the SOCOM Surgeon, but that was then and this is now and it is the right thing to do. This should not impact many, and as time goes on, it will be almost impossible for someone to not have ATP credentials trying to get into SOCMSSC. However, this will affect some people in the short term.

By the time this edition is on the streets, Steve Briggs will be getting ready to freeze his fanny off in Korea; his report date to Camp Humphreys is 9 January 2008. After his year on the peninsula, he is scheduled to return to SOCCENT in Tampa. I just want to make sure that, in front of the whole community, Steve is recognized for the tremendous contributions and improvements he has made to SOF medicine. He spent 57 months in the SOCOM Surgeon's Office; that in and of itself is deserving of a medal.

Just to recap a bit of history, Steve reported to the Surgeon's office immediately after the command released an interim policy which directed the creation of a joint, interoperable Special Operations Medic, the Advanced Tactical Practitioner (ATP). In an O-5 billet, with no staff and few resources, Steve was given the order to make it happen and he did. He was essentially a one-man enterprise and from nothing, Steve created the program that currently serves the SOF community. His ability to take the long view, and his many years of experience as a Special Operations Medical Sergeant, allowed him to develop a plan and ways ahead which gradually evolved and expanded into the current SOF medical certification program which now requires enough work to need the four-person strong Education and Training section that exists today within the Surgeon's Office.

Steve planned and coordinated the transition from a Department of Transportation EMT-Paramedic program to the newly created SOF ATP program. This was a gargantuan endeavor with which assistance was inconsistent, having the help of a single training NCO for maybe about half of his four-and-a-half year tour. The course transition gave an operational focus to the medical training program at the Joint Special Operations Medical Training Center (JSOMTC). More emphasis was given to combat

trauma, sick call conditions, and nursing care tasks which would not be part of a civilian paramedic course of instruction. These changes clearly increased the ability of SOF Medics and Corpsmen to care for their comrades on the battlefield and improve their chances of survival.

The process required a ground-level review of instruction and necessitated input from Operators who had participated in the fight in order to create a program of instruction that put the most needed medical skills in the hands of the most far-forward Medics. To do this, Steve created a network of experienced Operators and medical staff to focus on critical task requirements and formulate examinations that would fairly test students and certify them as capable to support our forces. For certification from an examination to hold any validity or merit, it was necessary to have a program evaluated by an outside civilian organization, recognized for its high standards, to give the course and JSOMTC accreditation. To that end, Steve worked with the Committee on Accreditation of Educational Programs for the Emergency Medical Service Professions (CoAEMSP) and Commission on the Accreditation of Allied Health Education Programs (CAAHEP) to ensure the ATP certifying examinations he created (no small task in-and-of itself) would satisfy accreditation requirements.

To track the certification of these new ATPs, Steve developed a database on his own time which is now used by staff as the standard means to maintain currency of records. In summary, Steve was literally "the man" regarding SOCOM medical education and training. It wasn't always fun, friendly, or pretty (Steve will be first to point that out), but it was productive and important and he has passed the torch (though we kind of had to pry his fingers off of it) to the next batch of hot shots. I am personally very grateful to Steve for all he has done for me and this office. I know Joe, Scotty, and Diane feel the same way. We all wish Steve the best of luck in his tour with the 2nd Combat Aviation Brigade. Please make sure you say good-bye to Steve through a phone call, e-mail, or in person at SOMA.



Advanced Tactical Practitioner (ATP) Test Guy

USSOCOM Physician Assistant, CPT Scott Gilpatrick

My name is CPT Scott Gilpatrick; however, I'd like to introduce myself as the guy taking CPT Steve Briggs' position and cubicle in the USSOCOM Surgeons Office. I will be putting together the Advanced Tactical Practitioner (ATP) test for administration at the JSOMTC and Kirtland AFB (PJ School) training centers. At first, like some in the SOF community, I was skeptical and I guess mostly unaware of what the ATP program was, and what was its purpose was. Now, after getting up to speed with the four years of Steve's hard work, I have become a believer in the usefulness of this program. There are people out there in the SOF community, quiet professionals doing a dirty job for little or no recognition; they are called the Curriculum Evaluation Board (CEB) and Requirements Board (RB). They are today's leaders in SOF Medicine and along with CPT Briggs; they have developed the incredible product we use now to evaluate the SOF Medics of tomorrow. The civilian personnel we have on the boards and actually leading the CEB are top notch, the best in their field as clinicians and medical educators.

This program is up, running, and growing thanks to the hard work of Steve, the CEB, and the RB. CPT Briggs will be missed here as he is the "go-to" guy for just about everything that happens in the training section of the Surgeons Office. He is a quiet professional and a workaholic. The Big Army is fortunate to get him as a clinician once again. I now look forward to working with the CEB and RB to get the same quality product to the two training centers.

For the skeptics, or those that are unsure of what the ATP program is and does for SOF medicine, take a look at the winter 2006 training supplement of the JSOM. That edition spells out in detail how and why the ATP program formed. In short, it's our own SOF-specific version of a certifying exam for paramedic-level providers. The ATP evaluates SOF Medics on the traditional paramedic curriculum as well as military and SOF medical subjects like TCCC, operational medicine, sick call medicine, and diving medicine to name a few. All of these areas come from the critical task list (CTL) appendix in USSOCOM Directive 40-2, (soon to be USSOCOM Regulation 350-29). The CTL was developed by the RB, and from the CTL and lessons learned from the units downrange, requirements go to the CEB for test question and protocol production. Test questions come to me and get put into a master ATP database. From this database the CEB and I produce and grade the ATP exams.

It all seems like a lot of work for a 150 question

test; however, I have seen firsthand that the ATP program works and produces a great product. I went to the old 300F-1 course at Ft. Sam as a Ranger Medic in 1991. We spent many hours learning about aseptic technique from R.V. Johnson, we did NREMT-B with Mrs. Dilworth, and when we graduated as the "first generation SOCMs" after the Trauma 3 clinic, we were the S@#T! Looking back, it was a great experience for a private in the Ranger Regiment. But much of what we got was the same as COL Farr got prior to graduating from the 18D course in 1968. Also, we could only send one or two guys per class, as it was not a mandated course for us back then.

Nowadays, all SOF Medics are required to attend training at either the JSOMTC or Kirtland facilities. The SOCMs and PJs today are smarter and possess a much broader and relevant skill set. I was fortunate to get to work with the Special Operations Flight Medics at the 160th prior to coming here. The SOCM-qualified ATPs in that unit, and all of the units we supported, are the best pre-hospital care providers in the world. I witnessed them firsthand, as many of you have, saving lives in the GWOT theaters.

The great Medics of today come from the hard work of SOF medical professionals looking at lessons learned. Medical folks tend to learn from what happened in the past and they do it well. From Lessons Learned analysis and AARs, the JSOMTC and PJ school curricula were developed. They are producing the great Medics we see today. The hard work on the part of all the instructors at both schools is to be commended. Let's not forget the recertification process for SOF Medics at the Special Operations Combat Medical Skills Sustainment Course (SOCMSSC). The SOCMSSC is instrumental in getting out the latest and greatest of information and equipment for SOF Medics. The initial courses and re-certification course work together to keep the SOF Medics the best out there today.

The ATP test looks at the product of the two SOF Medical Training schools and gives us an assessment. It lets us know if the Medic we want to send out onto the battlefield has met a baseline level of knowledge needed. It is the leaders and current practitioners of SOF medicine today that give us the requirements and develop the curriculum for which we test these Medics and PJs. With this, I think it is important for everyone to understand that this is your test. All SOF medical personnel, officers and enlisted, should know what goes onto this test and how it gets there. The ATP who gets presented a patient or situation,

whether a medical or trauma emergency, will know what to do in an austere environment thanks to the SOF Medical Training Centers, SOCMSSC, and the USSOCOM ATP Program.

Do you want to make a difference?

Do you want to apply for a position on the Curriculum Evaluation Board (CEB)? If you want to join and work toward making a better SOF Medic or developing the

Executive Editor's Note: Captain Steve Briggs has suffered the slings and arrows of everyone from the school house, the component commands, and all the surgeons. He has steadfastly upheld the ATP examination and made it what it is today. We all owe him a vote of thanks!

latest curriculum and protocols for SOF medical personnel, send a CV / Resume, ORB or ERB, and what position you are applying for to me at scott.gilpatrick@socom.mil. Please contact me if you have any questions about the positions and what goes into being on the CEB. We are accepting documentation from 1 Dec 2007 to 1 Jan 2008. We will also take inquiries and documentation at the SOMA conference this year. CEB members represent their particular specialty within the board to ensure that questions are developed consistent with the ATP mission as well as to act as subject matter experts in specific fields of medicine. Most interaction amongst members is via e-mail and online workspaces.

The current vacancies by job title on the CEB are listed below:

Voting Member Vacancies:

Air Force Specialty Code 1T271 (PJ)
Naval Enlisted Classification 5392 (SWCC Medic)
Naval Enlisted Classification 8427 (SARC)
MOS 68-WW4 (Civil Affairs Medic)
Military Physician Assigned to MARSOC
Military Physician Assigned to AFSOC
Military PA assigned to USASOC or JSOC
1 at large position (Enlisted or Officer)

Non Voting Member Vacancies (Advisory Positions):

Neurology
Cardiology
Pediatrics
Infectious Disease
Behavioral Health
OBGyn

SEND US YOUR STORIES AND LESSONS LEARNED!

The Education and Training section of the USSOCOM Surgeons office is looking for your stories, vignettes, or after action reviews from the GWOT. We want to hear about your experiences and more importantly the lessons you learned from that experience. Send us your story and we will review it for submission each month to the JSOM. With your story, we will discuss the lessons learned as it pertains to the components of SOF medical training. Send to scott.gilpatrick@socom.mil.

PLEASE DO THE FOLLOWING PRIOR TO SENDING

1. Remove names, unit, call signs
2. Have your unit S-2 review prior to sending to us. Let them know it's for submission to an open publication.
3. Submit as a word document.
4. Give us a story AND lessons learned.
5. Give us a paragraph about you and what you do (if your unit will allow).

MEDICAL LOGISTICS

Leveraging USSOCOM Acquisition Authority in Support of SOF Medicine

USSOCOM Title X Role

LTC Jose Baez

Title X, United States Code, Section 167 designates the Commander, USSOCOM, with the authority to conduct development and acquisition of Special Operations-peculiar equipment and acquisition of SO-peculiar materiel, services, and supplies. Title X Chapter 137 also delineates to the Secretary of Defense delegated authority to exercise the functions of Head of the Agency, Acquisition Executive, Program Executive Officers and Program Managers in order to manage SOF-peculiar programs.

The Special Operation Acquisition and Logistics (SOAL) Directorate has these Acquisition Executive responsibilities. The Directorate is further divided into several Program Executive Offices (PEO) such as Naval Systems, Rotary Wing, Fixed Wing, Special Programs, and SOF Warrior.

In 2006, the USSOCOM Command Surgeon office began a collective effort to develop an initial capability document (ICD) to address Level I combat health service support capability gaps within SOF. This effort supported a 2005 message from the Commander USSOCOM (Gen Brown) directing all subordinate commands to train and further equip all SO forces on the latest Tactical Combat Casualty Care (TCCC) protocols, procedures and equipment prior to deployment.

ICD was approved on June 2006 and the efforts realigned under the SOAL PEO SOF Warrior (PEO-SW) for program development and management. Program management execution authority was further delegated to the U.S. Army Medical Materiel Agency (USAMMA). USSOCOM leveraged their expertise in medical sets development and procurement. By utilizing the integrated product team (IPT) concept the program was able to effectively satisfy DOD 5000 Acquisition Program requirements. Some of these requirements were: capability development document (CDD), capability production document (CPD), test plan documents, materiel fielding plan and simplified acquisition management plan (SAMP).

In September 2007 the SOF Tactical Combat Casualty Care (TCCC) program IPT achieved the program milestone C phase, which entails the production and deployment of the capability. This achievement is a direct result of ef-

fective leveraging of expertise from the SOF medical, logistics, acquisition, and commercial communities.

SOF TACTICAL COMBAT CASUALTY CARE FOCUS

The SOF Tactical Combat Casualty Care (TCCC) is our systematic method for care of combat wounded from point of wounding under fire to handing off to conventional evacuation assets. It combines both specific medical items and training to Operators and Medics. The three objectives of TCCC are to continue the mission, treat the casualty, and prevent additional casualties. Spurred by Mogadishu and evolving over more than ten years, TCCC is now the SOF standard for addressing battlefield injuries and is being rapidly adopted by the conventional forces. Prehospital trauma care in combat is significantly different from that performed by paramedics in the civilian sector. Treatment protocols used in the civilian setting are not transferable to the battlefield. Following civilian pre-hospital protocols would allow preventable deaths and unnecessary additional casualties if the tactical environment is not considered while providing care. Additionally, many battlefield settings are austere, with limited availability of advanced equipment, and may have a long evacuation sequence. With these constraints, along with the chaotic nature of conflict, it is essential that methods and equipment are easy to learn and perform reliably under duress. Equipment and supplies must be simple, effective, light, and rugged and developed to fit the SOF battlefield.

The Special Operations community first published TCCC guidelines in 1996 and has expanded their use, modified techniques, supplies, and equipment ever since, based on recommendations from the Committee on TCCC (CoTCCC). This process of training and equipment was mandated by CDR, USSOCOM. Numerous reports in the medical literature and collected from combat first responders have documented that TCCC is saving lives on the battlefield and improving the tactical flow of missions on which casualties have occurred. The statistics back up these anecdotal reports as OEF/OIF Case Fatality Rates are two times less than WWII and 1.7 times less than Vietnam. Killed in Action rates are one and one-half times less than

WWII and Vietnam. There are multiple factors contributing to these decreases such as body armor, fast evacuation, and early surgical intervention. However, putting it simply, effective products in the hands of the combatants, as well as SOF Medics, combined with focused training in their use (TCCC) has played a large part in this improvement over previous conflicts.

Uncontrolled bleeding from extremity hemorrhage was the cause of death for more than 2500 fatalities in Vietnam and is still the leading cause of preventable deaths on the battlefield today. Proper use of an effective tourniquet could prevent many of these deaths. Previously, there was no widely available and cost-effective method to control bleeding from sites not amenable to tourniquets, such as the torso, head and neck. Now, better tourniquets have been created and medical technology has brought forth bandages, which react with blood to cause it to clot (hemostatic dressings). In 2005 a decision was made to provide all deploying service members with tourniquets, and later, hemostatic dressings. Though uncontrolled hemorrhage is the most commonly described contributor to preventable deaths, and tourniquets and hemostatic dressings go a long way to preclude fatalities, other causes of/contributors to preventable deaths include shock, hypothermia, infection, and inadequate oxygenation.

The TCCC Program focuses on three phases. They are Care Under Fire, Tactical Field Care, and Casualty Evacuation (CASEVAC) Care.

CARE UNDER FIRE: Rendered at the scene of the injury while both the Medic and the casualty are under hostile fire as the mission continues. Available medical equipment is limited to that carried by each Operator and Medic.

TACTICAL FIELD CARE: Rendered once the casualty is no longer under hostile fire. Medical equipment is still limited to that carried into the field by mission personnel or their vehicles. Time prior to evacuation may range from minutes to hours or even days.

COMBAT CASUALTY EVACUATION CARE (CASE-VAC): Rendered while the casualty is evacuated to a higher echelon of care. Any additional personnel and medical equipment pre-staged in these assets will be available during this phase.

TCCC PROGRAM INCREMENT I EQUIPMENT OPERATOR KIT

It must be noted that TCCC is not limited to performance by medical personnel, but that these phases of care apply to ALL service members on the battlefield. To this end, USSOCOM SOF TCCC Program has developed as part

of Increment I, a Combat Operator Trauma Kit (SOF-IFAK). The Operator Kit contains a tourniquet, hemostatic dressing, nasopharyngeal (from nostril to back of the throat) airway, and “combat pill pack” which includes anti-inflammatory and antibiotic drugs. Further, members are instructed to use the contents of the kit on themselves should they become injured under fire and are able to do so. The tourniquet can be applied with only one hand and can be applied to extremity wounds. Wounded personnel then take the pill pack to help prevent inflammation, pain, and infection. Non-medical personnel are trained to apply a casualty’s hemostatic dressing if required, as well as inserting the nasopharyngeal airway to help prevent an occluded airway when necessary. As occasionally it is the Medic who is wounded, the non-Medic Operators must also be properly trained and equipped.

MEDIC KIT

Medical personnel are being equipped with a Combat Medic Trauma kit, which, in addition to the Operator Kit, includes colloidal resuscitation fluids, sternal (breastbone) intraosseous fluid administration set, pulse oximeter to measure oxygen level in the blood, narcotic pain medication, and a potent antibiotic. These additional items aid the Medic in giving the patient needed fluids that stay in the vessels longer than usual IV fluids used in pre-hospital trauma patients (e.g., Ringers Lactate or saline). The sternal administration device allows the Medic to get fluids into a patient when pressure is very low and blood vessels cannot be catheterized to allow fluid therapy. The pulse oximeter is a very small, portable device that can be easily placed on most patients to determine the need for supplemental oxygen (usually during the CASEVAC phase).

TCCC PROGRAM INCREMENT II EQUIPMENT

Currently, USSOCOM Command Surgeon’s office, in conjunction with the SOF Service Components Surgeons, Joint Special Operation Medical Training Center, USAMMA, and PEO-SW are assessing medical materiel solutions that can mitigate capability gaps within the medical officer tool sets and casualty evacuation alternatives. These gaps directly relate to the fact that SOF lacks an organic health service support (HSS) Level II capability, and lack dedicated medical evacuation assets. The only Level II capability within SOF is within AFSOC in the form of SOST/SOCETS and the USASOC Special Operations Sustainment Brigade (SOSB). These low-density, high-demand AFSOC teams are not enough to cover all SOF mission requirements. As a result, SOF relies on opportune Level II HSS and evacuation from conventional forces when available.

The focus of increment II is to provide the medical officer, physician assistant and senior level Medic/Corpsman with additional tools to treat and stabilize the casualty for further evacuation. The SOF casualty evacuation lead times might be up to four times that of a conventional force casualty due to the mission or security classification. The potential Increment II tools might range from simple durable devices to high-tech surgical support equipment that might be mission specific, such as those used for high-altitude medicine.

Casualty evacuation (CASEVAC) kits for SOF will take in consideration non-traditional means of transportation, as well as the mission environment to include consequent management environments.

SUSTAINMENT

Even though USSOCOM has SO-peculiar medical requirements, an effort has been made to include the DOD DLA executive agent and its prime vendor network for Class VIII support for sustainment. Current OPTEMPO has resulted in SOF presence at every single AOR. As a result, Class VIII re-supply and medical maintenance becomes a challenging issue while deployed, especially at undeveloped theater operations. It is the TCCC Program intent to ensure that any item introduced has a Joint 6545 medical NSN recognized by the Defense Medical Standardization Board (DMSB) and USAMMA. Furthermore, we must ensure that any pharmaceutical, to include con-

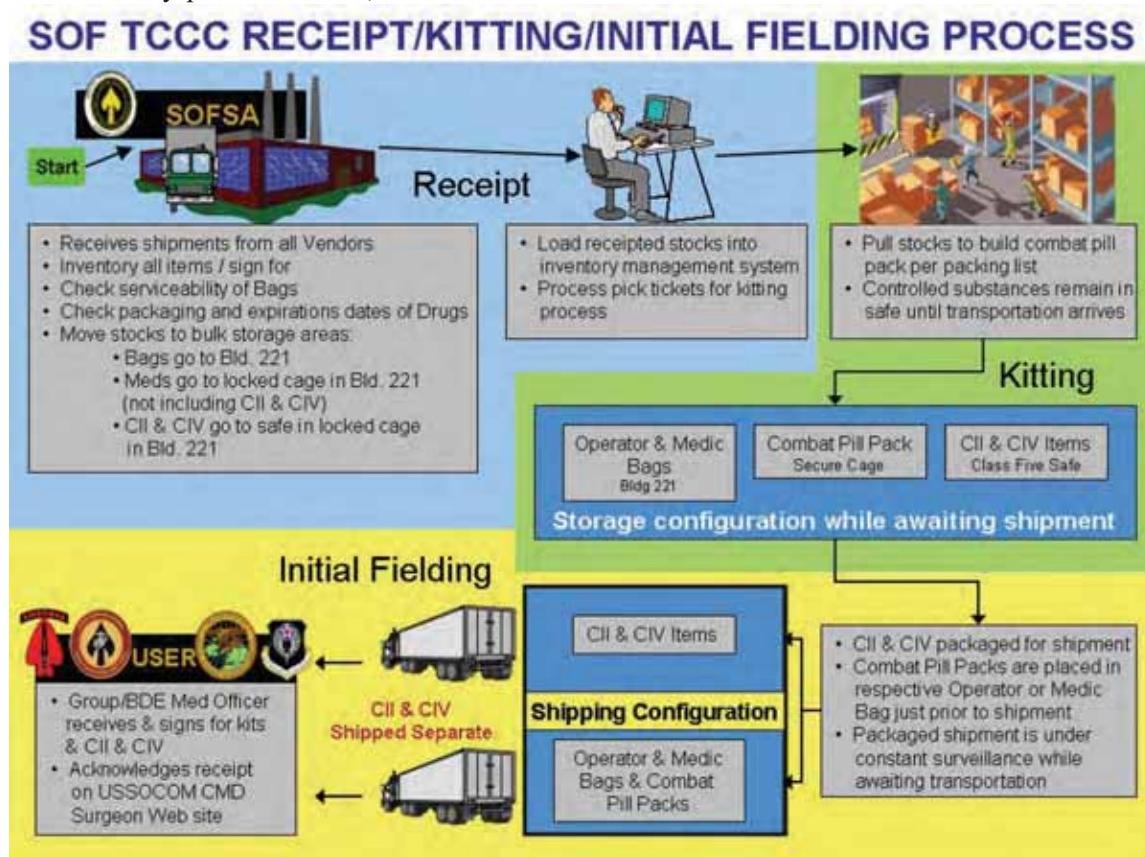
trolled substances, are included in the supported GCC formulary and stock at the supported medical logistics unit. By using USAMMA as our program manager, we have just done that for Increment I. Increment II will follow the same intent, with the addition of medical maintenance support as the complexity of kits increase over time.

TCCC FIELDING

Increment I initial operational capability (IOC) fielding is currently scheduled for 1st quarter FY08, followed by the full operational capability (FOC) 2nd and 3rd quarter FY09. This fielding will be coordinated with each SOCOM service components' Surgeon's Office medical logistics POC and will be pushed from our Special Operations support activity (SOSA) down to the group/brigade/squadron level medical-accountable officer. (See the fielding flow diagram.)

SOF MEDICAL ACQUISITION FUTURE

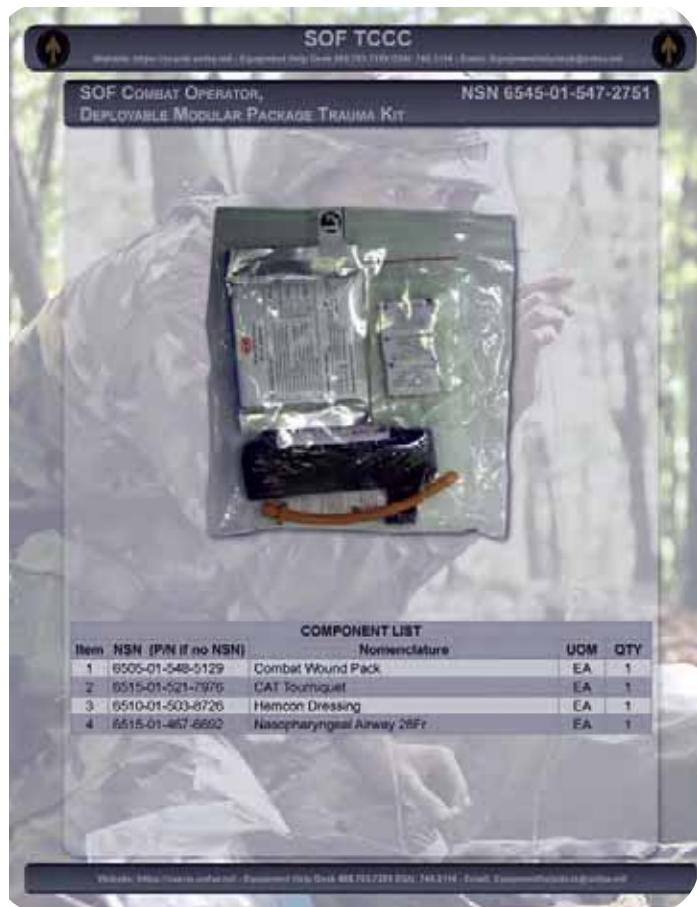
The evolution and expansion of TCCC throughout SOF has clearly made a difference in battlefield survival. There must be continued support for this process of continual reevaluation and modification based on advances in medicine and the technology that goes with it. TCCC guidance and equipment changes rapidly as more is learned from the battlefield. Only the command has the agility to keep up with the fielding of evolving combat casualty care.



USSOCOM recognizes the importance and positive impact the medical community has, not only in saving warrior lives, but also influencing other USSOCOM acquisition programs. USSOCOM SG office staff is currently integrated in several other non-medical programs to provide input as stakeholders in system designs, injury prevention, force health protection, medical intelligence, and future technologies. One recent example is our involve-

ment with the internal design of the new USSOCOM MRAP RG-31 on its CASEVAC capabilities. We must continue to lean forward in the foxhole to be an integral part of the community. I encourage all of you to share lessons learned from our perspective with your respective J-8, J-4, and acquisition counterparts. There are no SOF medical combat developers. Therefore, it is our responsibility to ensure that our requirements are noted by others.





Correspondence

Letters to the Editor & Apologies to the Readers

I would like to take this opportunity to thank CAPT Steve Giebner, (Ret) from the bottom of my heart and every broken bone and joint in this old Frogman's body. May I also speak for all of the Combat Soldiers, Sailors, Airmen, and Marines in Special Operations and now throughout the services who have in the past, now and the future continue to carry the "Art of Medicine" onto the battlefield.

I have had the privilege of knowing CAPT Giebner for most of my career in SPECOPS, and he has always been one of my mentors, always taken the time to explain the unexplainable, teach the un-teachable and ensure that the Medic on the ground always had an opinion, a voice, and a vote in what has come to be the Committee on Tactical Combat Causality Care.

It takes a very special person to put up with all the "Special Opinions," "Hear Me First Attitudes," the "I have the next best thing since sliced whatever." Dr Giebner's ability to gather, manage, direct, and maintain focus on, in my opinion, the most unbelievable and diverse collection of medical professionals from all walks of the medical spectrum, from the United States Surgeon General all the way down to the Second Class Corpsman/Medic. It was Steve Giebner who directed and managed all of us to bring to fruition the most important innovations of battlefield medicine. TCCC for our forces is a commendable feat in itself, and Dr. Giebner should be extremely proud of his accomplishments.

None of this would have happened as it did without his leadership, guidance, perseverance, and ability to put up with more bureaucratic bullshit than any man should have ever dealt with in his lifetime. His keen foresight and willingness to "listen" to your senior enlisted Medics who speak for the enlisted medical force, and to keep at bay those individuals who would not want to hear from us, is greatly appreciated and has now become, again in my opinion, one of his single most important contributions to the structure of the committee itself.

In closing, there are many lives on the fields of battle who have been spared by Dr. Giebner's expertise, background, and constant "herding of the cats" to ensure that what was presented, designed, taught, and finally implemented was, and continues to be, absolutely the most correct, up to date, state-of-the-art tactics, techniques, and procedures for the practice of Tactical Combat Causality Care.

A big "**Bravo Zulu**" for a job extremely well done SHIPMATE!

With grateful appreciation,

Gary "Doc" Welt
HMCM, USN, Ret.
Former Senior Enlisted Medical Advisor
United States Special Operations Command

Executive Editor's Note: CAPT (Ret) Steve Giebner is re-retiring, this time from the TCCC Committee chair position. He has been instrumental in bringing forth the 6th Edition of PHTLS and recent TCCC changes.

Well done! Steve

Current Events

USSOCOM Holds Historic Change of Command Ceremony

Mike Bottoms and Master Sergeant Laura LeBeau
USSOCOM Public Affairs



MacDill Air Force Base, FL

ADM Eric T. Olson became the first Navy officer to command U.S. Special Operations Command when Army GEN Doug Brown turned the helm over to him at a 10 a.m. ceremony July 9 at the Tampa Convention Center.

ADM Olson, 55, a Navy SEAL for 34 years and the first SEAL to achieve four-star rank, assumed duties as commander of USSOCOM from GEN Brown. Brown, who has led USSOCOM for almost four years and is the command's longest serving commander, is retiring after 40 years of service to the nation.

Defense Secretary Robert Gates presided over the ceremony and praised Brown for the work he and the command have accomplished synchronizing the Global War on Terrorism.

"He came to this post four years ago determined to improve the way Special Operators fight," Gates said. "He has done just that."

Brown also streamlined the command and made it more efficient, the secretary said. He is responsible for the creation of the Center for Special Operations. The changes allowed different Special Operations specialties to build on

each other rather than compete. Gates praised the intelligence community for working side by side with Special Operators, "fusing their expertise and planning to greatly improve results."

Brown began his remarks by thanking all the wounded warriors and SOF Medal of Honor recipients in attendance at the ceremony. He also thanked Congress and particularly Congressman Bill Young from Florida's 10th Congressional District.

"We're honored to have the Honorable Bill Young and his wife Beverly here today, representing our Congress. The importance of Congress to this command cannot really be over emphasized because it is, in fact, responsible for establishing this organization," said Brown. "I like to think the vision Congress had, 20 years ago this year, has really proven its relevancy today."

Brown noted Olson has all the abilities to be a great commander. "As we leave this stage, a new commander will be at the reins of the 'the world's gold standard for Special Ops,' and he is the right guy," Brown said. "I have marveled at his intellect, his insight, his vision, his hard work, his patience, his courage to make the hard decision, and his un-

derstanding of all the parts of SOF ... He is a wonderful joint SOF Operator who also happens to be a SEAL."

Gates also expressed confidence Olson will build on Brown's good work, noting the admiral has vast joint experience in Special Operations. He praised Olson's reputation as always giving the unvarnished truth. "There is no mistaking his combination of courage, experience, and leadership," Gates said. "I want you to continue your custom of giving honest opinions and recommendations — with the bark off and straight from the shoulder." Olson thanked Brown and reminded everyone of the importance of USSOCOM's mission.

"It is an honor to take command and to continue the great work of GEN Brown," Olson said. "I intend to reinforce our enduring priorities: to deter, disrupt, and defeat terrorist threats; develop and support our people and take care of their families; and modernize our force."

Olson graduated from the U.S. Naval Academy in 1973. A Tacoma, WA, native, he has served at every level in SEAL and Naval Special Warfare units from SEAL platoon officer-in-charge to the command of Naval Special Warfare Command. In addition to serving in SEAL teams, SEAL delivery vehicle teams, and special boat squadrons, he is a joint

specialty officer and political-military affairs sub-specialist with emphasis on Africa and the Middle East. His overseas assignments include service as a United Nations military observer in Israel and Egypt, and as Navy programs officer in Tunisia. He served on the Navy staff as Assistant Deputy Chief of Naval Operations (Plans, Policy, and Operations).

In October 1993, Olson played a key role during the bloody urban battle in Mogadishu, Somalia. After a pair of Army Black Hawk helicopters were shot down by enemy fire, Olson helped organize and lead a relief team to the crash sites. He was awarded a Silver Star, the military's third highest award for combat valor.

ADM Olson earned a Master of Arts degree in National Security Affairs at the Naval Postgraduate School and studied both Arabic and French at the Defense Language Institute. He has participated in several conflicts and contingency operations and his awards include the Distinguished Service Medal, Silver Star and Bronze Star with V device.

Olson becomes the eighth USSOCOM commander. The prior seven commanders include General Brown, Air Force General Charles Holland, Army Generals Peter Schoomaker, Hugh Shelton, Wayne Downing, Carl Stiner, and James Lindsay.



An Unconscious Diver with Pulmonary Abnormalities: Problems Associated with Closed Circuit Underwater Breathing Apparatus

Dana E. Adkins, MD; Richard T. Mahon, MD; Steven Bennett, MD

ABSTRACT

Closed circuit underwater breathing apparatus (UBA) have gained popularity in recreational diving. Closed circuit UBAs carry a unique set of risks to the diver. We present the case of a diver who lost consciousness while diving and had pulmonary abnormalities. The case is illustrative of the diving related problems associated with closed circuit UBA that a physician may be faced with.

Learning Objectives

1. Review the history and use of a closed circuit diving apparatus in civilian and military medicine.
2. Learn the major complications of diving on a closed circuit breathing apparatus with a high fraction of inspired oxygen.
3. Review the case study of a diving casualty sustained while diving on a closed circuit dive apparatus.

INTRODUCTION

Closed circuit underwater breathing apparatus (UBA) (re-breathers) were first tested in 1879 and have been widely used since World War II.¹ Though primarily used in military applications, UBAs have gained popularity in civilian diving.² There are several re-breather units available, most modeled after the Lambertson Amphibious Respiratory Unit (LARU), named for its inventor, Doctor Christopher Lamberston.³

Though re-breathers may accommodate a variety of gas mixtures, the simplest closed circuit UBA is an oxygen (O₂) re-breather that utilizes 100% O₂ as its supply gas. All re-breathers have in common a closed circuit breathing loop, a small high pressured cylinder gas supply, and the ability to remove carbon dioxide (CO₂) via chemical scrubbing.⁴ The absence of bubbles resulting from the re-breathing system minimizes enemy detection and disruption of surrounding aquatic life, making it popular with operational Special Forces as well as recreational divers. Its light-weight design is another popular feature, and the fact that no inert gas is taken up by the diver minimizes the risk of decompression sickness.¹

Re-breathers are used in less than 1% of recreational dives but account for 4.5% of diving related deaths in that community.² Along with the benefits, re-breather systems carry a set of unique risks for the diver mostly from high partial pressures of O₂, potential for increased levels of CO₂, and the presence of a caustic CO₂ removal

substance. We present the case of a military diver who suffered a dive injury while on a closed circuit re-breather that illustrates the unique problems that may be encountered in closed circuit UBA.

CASE PRESENTATION

A 25 year old Navy SEAL (Sea Air and Land) presented after loss of consciousness and witnessed convulsions during a training dive with a Draeger LAR V re-breather apparatus utilizing 100% O₂ as the supply gas. The dive profile was part of an extensive five hour training evolution utilizing Navy combat swimmer multi dive tables (CSMD) and this dive consisted of an approximate 30 minute bottom time with two excursions below 40 feet of seawater (fsw). During the second excursion he developed euphoria, facial twitching, and trismus. He made an assisted ascent while attempting to draw from his regulator with an involuntarily clenched mandible. At the surface he was determined to be unconscious by his dive partner and his facemask was removed. The on scene Corpsman witnessed convulsive activity, and on initial evaluation the patient was pulseless and unresponsive. Resuscitation was started immediately with an immediate return of pulse and breathing and expectorated pink, frothy sputum was noted. Concerns for arterial gas embolism prompted an evacuation to a hyperbaric chamber and recompression therapy with a Treatment Table Six from the Navy Dive Manual. The patient had a gradual

improvement of his mental status from the time of his initial resuscitation, but during recompression treatment complained of continued significant substernal chest pain and dyspnea. Subsequently, he was evacuated via air ambulance maintaining an altitude of < 500 feet to an ICU. On presentation to the ICU he was somnolent but arousable.

Physical examination showed petechiae on his upper eyelids, dried peri-oral blood, tachypnea, decreased breath sounds at the lung bases, and mild expiratory wheezing. Neurological exam showed no focal deficits. Lab values were notable for an ABG (pH 7.24, PCO₂ 53 mmHg, and PO₂ 70mmHg) and a leukocytosis of $9.4 \times 10^3/\text{mm}^3$ with 61% bands. Basic chemistry analysis, cardiac enzymes, and liver function tests were normal. Initial chest radiograph (Figure 1) and CT scan demonstrated diffuse alveolar infiltrates with dense bilateral lower lobe consolidation. An echocardiogram with bubble study revealed a patent foramen ovale (PFO); an MRI and EEG were both normal. Antibiotics and diuretics were started with improvement in his dyspnea and chest radiograph over the next

three days. Outpatient follow-up 10 days after presentation revealed resolution of shortness of breath, normal vital signs, normal detailed neurological exam and a normal chest radiograph (Figure 2). Pulmonary function testing revealed a mild obstructive pattern with a positive bronchodilator response and normal diffusion capacity for carbon monoxide.

DISCUSSION - Re-breathers

There are essentially two forms of self contained underwater breathing apparatus (SCUBA). Open circuit apparatus utilize compressed gas from a cylinder that is then exhaled into the surrounding environment. Closed circuit UBAs (re-breathers) use a closed breathing circuit that allows exhaled air to be “scrubbed” free of CO₂ by absorbent materials (soda-lime). This CO₂ free air is then returned to the diver to meet their metabolic demands. The most common gas used for re-breathing circuits is O₂. Generally a small high-pressure gas cylinder inflates a breathing bag (counter lung) that is in circuit with the scrubbing system. As the O₂ is metabolically consumed the counter lung de-

flates and a pressure regulated demand valve opens a high pressure bottle of O₂, filling the bag. Through purging techniques, a fraction of inspired O₂ > 74% can be achieved.⁴ Re-breathers offer the diver a lightweight design that improves stealth and, by limiting inert gas uptake, decrease the risk of decompression sickness. However re-breathers add complexity and unique risks to diving. This case illustrates some of the potential injuries that may be associated with re-breather systems.

HYPERBARIC OXYGEN RELATED SEIZURES

In O₂ re-breather systems the partial pressure of O₂ is increased as the diver descends in the water column. For every 33 fsw, atmospheric pressure is doubled. At a depth of 33 fsw the partial pressure of 100% O₂ will be 1520mmHg. High partial pressures of O₂ are associated

with seizures and diving limits for 100% O₂ have been established through extensive work by Butler largely based on seizure risk.^{5,6} It has been demonstrated that there is wide inter- and intra-individual variability



Figure 1



Figure 2

in central nervous system (CNS) oxygen toxicity and that one's risk can change with exertion and environmental factors.⁶ Symptoms of CNS hyperbaric oxygen (HBO) toxicity range from tunnel vision, tinnitus, nausea, irritability, and dizziness to frank convulsions. Though many divers will have symptoms prior to convulsions, convulsions may be the first symptom manifested. The seizure itself is generally self-limited and is not considered to be harmful, but in the underwater environment it can be extremely hazardous.⁷ Treatment for in-water seizures is to reduce the partial pressure of O₂ by a slow ascent rate once the seizure has stopped. If an HBO seizure occurs in a hyperbaric chamber the diver or patient is removed from the high O₂ fraction atmosphere (i.e., switch the breathing gas to air) and the ambient pressure is decreased appropriately.

The mechanism of HBO seizures is not fully known but is likely related to O₂ generated free radicals and endothelially derived nitric oxide synthase (eNOS).^{7,8} When superoxide is generated (O₂⁻), nitric oxide (NO) is inactivated to hydrogen peroxide (H₂O₂) and peroxy nitrite (ONOO⁻). This causes a decrease in available NO and de-

creases cerebral blood flow (CBF).⁹ With prolonged HBO exposure, eNOS is upregulated and there is a resultant increase in CBF that precedes the onset of seizure.^{7,9,10} This case is consistent with oxygen toxicity seizure in both patient presentation and history.

ARTERIAL GAS EMBOLISM

An additional concern in the unconscious diver is barotrauma and arterial gas embolism (AGE). Boyle's law states that as pressure is reduced, volume will increase proportionally. Ascent from 33 feet of sea water to the surface would be associated with a theoretical doubling of gas volume. If a diver is unable to exhale during ascent or if there are structural lung abnormalities that impede the normal air flow, pulmonary over-inflation and barotrauma may result.¹¹ This could manifest as pneumothorax, pneumomediastinum, subcutaneous emphysema or the escape of gas into the arterial system resulting in AGE. The large bubbles produced obstruct blood flow to vital organs, including the CNS. The most common presenting symptoms are changes in cognition and unconsciousness, but seizures and focal deficits may be present. AGE demands rapid assessment and treatment. The definitive treatment for AGE is recompression and HBO. Recompression therapy for AGE in divers has been proven to be successful when performed expeditiously.¹² The patient in this case was unconscious on the surface and appropriately received immediate recompression therapy; he also complained of chest pain that may be consistent with pneumomediastinum, though none was evident on subsequent radiographic imaging.

HYPOXEMIA AND HYPERCARBIA

Re-breathers also present a risk for hypoxemia and hypercarbia. Though on O₂ re-breather systems the diver is delivered 100% O₂, it is possible for the O₂ source to be metabolically used on long dives. As the diver is at depth it is unlikely that a low fraction of inspired O₂ will become symptomatic, but as the diver ascends and the partial pressure of O₂ is decreased there is a potential for symptomatic hypoxia.⁴ The clinical presentation expected would be a diver who loses consciousness or suffers a seizure while surfacing. This presentation should be distinguished from unconsciousness at depth related to seizure or hypercarbia, but may be difficult to separate from AGE.

In re-breathers, CO₂ is removed from the breathing circuit by a canister containing a CO₂ absorbent material, most commonly sodalime, and there are several potential failures in this system. Sodalime's effectiveness may be expended on long dives, compromised in the presence of moisture, reduced through the formation of channels within a canister decreasing the effective surface

area, or when a diver's workload exertion creates a high respiratory rate and a "blow by effect" where the exhaled air does not have enough dwell time to allow effective CO₂ removal. In addition, the combination of hyperoxia and exercise predispose some divers to CO₂ retention that is largely variable and is commonly not recognized.¹³ The symptoms of hypercarbia are progressive, and as the concentration of CO₂ increases the onset of symptoms is gradual. The first symptom is usually an increase in the rate and volume of breathing as the respiratory system attempts to compensate for the buildup of CO₂ in the blood. As hypercarbia worsens hyperventilation evolves to frank dyspnea, and a severe throbbing headache may ensue in a portion of victims. Finally, further CO₂ accumulation leads to altered mental status and unconsciousness.¹⁴

The history and onset of symptoms in this case were rapid and devastating. In hypercarbia the initial hyperventilation is often masked by the increased workload inherent in a strenuous dive. It is not typical, however, for the diver to remain asymptomatic until a loss of consciousness. It should be noted that an increase in the partial pressure of CO₂ has been shown to increase susceptibility to an HBO seizure, but there is no evidence to support this in this case.⁷ The primary neurologic insult of HBO seizure with trismus and unconsciousness at depth predisposed the diver to have pulmonary complications. These complications have a differential to include near drowning, aspiration of a caustic substance, pulmonary edema of immersion, and negative pressure pulmonary edema.

NEAR DROWNING AND ASPIRATION

Near drowning (ND) refers to aspiration of a liquid (most commonly water) that does not result in immediate death, where drowning refers to death by suffocation after immersion. Civilian SCUBA diving related drowning accounts for (53%) of diving related deaths but are <1% of the more than 5,600 drowning deaths in the United States alone.² At least 85% percent of drowning is associated with aspiration of contents into the lungs, where 3 to 15% may be not be associated with fluid filled lungs (dry drowning).¹⁵ The early (< 4h) pulmonary effects of ND include loss of surfactant, pneumonitis, and decreased compliance leading to shunt physiology and hypoxemia. Bronchospasm and pneumothorax have also been described in the ND victim.¹⁴

In this case the diver was at high risk for aspirating the CO₂ scrubbing medium. In closed circuit breathing a chemical agent is used to eliminate CO₂. The most commonly used substance is soda-lime, which is a combination of calcium hydroxide (Ca(OH)₂), sodium hydroxide (NaOH), and potassium hydroxide (KOH). Optimally CO₂ combines with the hydroxides and creates an anhydride,

water, and heat. Generally, the soda-lime is contained in a canister to prevent particulate matter from entering the breathing loop. However, when the hydroxides comes in contact with water it creates a caustic alkali liquid, sometimes referred to as a “caustic cocktail” which can escape into the breathing loop.¹⁵ Alkalies produce liquefactive necrosis that can cause deeper tissue penetration potentially more significant than thermal burns.¹⁶ The major anticipated respiratory injury is to the upper and lower airways and include laryngeal edema and airflow obstruction.¹⁶ There was no evidence of the phenomenon in this case.

PULMONARY EDEMA OF IMMERSION

Pulmonary edema of immersion has been described in surface swimming and in SCUBA diving. When associated with surface swimming it has been referred to as swimming induced pulmonary edema (SIPE). SIPE is a form of exertionally related non-cardiogenic pulmonary edema as a result of pulmonary capillary stress failure.^{17,18} In upright immersion external pressure differentials increase intra-thoracic fluid volume that may combine with an increased cardiac after load and exercise with increased in pulmonary artery pressure.¹⁹ These forces then increase the pulmonary trans-capillary pressure leading to stress failure of the thin walled pulmonary capillaries. SIPE is self-limiting and generally resolves within 24 h of presentation. Treatment for SIPE is supportive and may include positive pressure breathing and beta agonists to enhance alveolar clearance of fluid.²⁰

NEGATIVE PRESSURE PULMONARY EDEMA

Negative pressure pulmonary edema (NPPE) has been reported in a large array of conditions associated with upper airway obstruction.²¹ As described by Louis, obstruction of the upper airway is associated with the generation of large negative and positive airway pressure. Large swings in negative intra-thoracic pressure increase venous return and combine with increased after-load and left-ventricular dysfunction to increase capillary pressure. The large positive airway pressure associated with upper airway obstruction prevent alveolar edema formation based on Starling forces. Within minutes after the upper airway obstruction is relieved the increased capillary pressures allow transudation of fluid into the alveolar space, or may be associated with capillary stress failure and leakage of large molecular weight proteins and red blood cells. The treatment for NPPE is largely supportive and may require mechanical ventilation. Generally there is significant clinical and radiographic improvement within 24 hours.



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SUMMARY

This case illustrates potential dive related injuries associated with oxygen re-breather systems. The patient suffered from hyperbaric oxygen related seizure and likely had negative pressure pulmonary edema and aspiration of seawater. Given the concern for AGE the patient appropriately received immediate recompression therapy and responded to supportive care for his lung injury. On follow-up at one year he had normalization of his lung function and a medical return to dive status.

REFERENCES

1. Butler, F. K., Jr. (2004). Closed-circuit oxygen diving in the U.S. Navy. *Undersea & Hyperbaric Medicine*. 31(1): 3-20
2. DAN Divers Alert Network. Annual Review of Recreational Scuba Diving Injuries and Fatalities, 2004 Edition
3. Searle W.F., (1966). A history of man's deep submergence. United States Naval Institute Proceedings. 92:80-92.
4. Nuckols, M. L. (1996). Oxygen levels in closed circuit UBAs during descent. Life Support & Biosphere Science. *International Journal of Earth Space* 2(3-4): 117-24.
5. Parker EC, Survanshi SS, Weathersby PK, Thalman ED. Statistically based decompression tables VIII. Linear exponential kinetics. Technical report of the Naval Medical Research Institute, Bethesda, MD
6. Butler, F. K., Jr. and Thalmann, E. D. (1986). Central nervous system oxygen toxicity in closed circuit scuba divers II. *Undersea Biomedical Research*; 13(2): 193-223.
7. Bitterman, N. (2004). CNS oxygen toxicity. [Review] [76 refs]. *Undersea & Hyperbaric Medicine*; 31(1):63-72.
8. Chavko, M., Braisted, J. C. et al. (1998). Role of cerebral blood flow in seizures from hyperbaric oxygen exposure. *Brain Research*; 791(1-2):75-82, Apr 27.
9. Demchenko, I. T., Boso, A. E., et al. (2000). Nitric oxide and cerebral blood flow responses to hyperbaric oxygen. *Journal of Applied Physiology*; 88(4):1381-9, Apr.
10. Demchenko, I. T., Boso, A. E., et al. (2000). Hyperbaric oxygen reduces cerebral blood flow by inactivating nitric oxide. *Nitric Oxide*; 4(6):597-608, Dec.
11. Tetzlaff, K., Reuter, M., et al. (1997). Risk factors for pulmonary barotrauma in divers.[see comment]. *Chest*; 112(3): 654-9.
12. Kindwall EP, Johnson JP. (1990). Outcome of hyperbaric treatment in 32 cases of air embolism (abs). Proceedings: Joint Meeting on Diving and Hyperbaric Medicine, 11-18 August. Amsterdam, The Netherlands, pg. 90.
13. Eynan, M., Arieli, R., et al. (2005). Response to CO₂ in novice closed-circuit apparatus divers and after one year of active oxygen diving at shallow depths. *Journal of Applied Physiology* 98(5): 1653-9.
14. Bove, A. (2004). Toxicity of oxygen, carbon dioxide, and carbon monoxide. pp. 241-260 *Diving Medicine*. 4th ed.
15. JN, E. L. C. E. G. a. M. (1999). The lung at depth. *Lung Physiology in Health and Disease* 132.
16. Middelkamp JN, Ferguson TB, Roper CL, Hoffman FD. (1969). The management and problems of caustic burns in children. *J Thorac Cardiovasc Surg*; 57(3):341-7
17. Lund, K. L., Mahon, R. T., et al. (2003). Swimming-induced pulmonary edema. *Annals of Emergency Medicine*. 41(2):251-6.
18. Ludwig, BB, M. R., C. Lamb, S. Kerr (2004). Pulmonary edema in combat swimmers: Clinical and bronchoalveolar lavage description demonstrating stress failure of the pulmonary capillaries. *Undersea Hyperb Med*; 31(3): 318.
19. Arborelius, M., Jr., Ballidin, U. I., et al. (1972). Hemodynamic changes in man during immersion with the head above water. *Aerospace Medicine*; 43(6): 592-8.
20. Ware LB, Matthay MA. (2001). Alveolar fluid clearance is impaired in the majority of patients with acute lung injury and the acute respiratory distress syndrome. *Am J Respir Crit Care Med*; Vol 163:1376-83.
21. Mehta VM, Har-El G, Goldstein NA. (2006). Postobstructive pulmonary edema after laryngospasms in the otolaryngology patient. *Laryngoscope* ; 116: 1693-96

What Every SOF Medic Should Know About Agroterrorism – Part I

Kathleen Dunn Farr, MD

ABSTRACT

Agroterrorism is “the deliberate introduction of a disease agent into livestock herds for the purposes of undermining socio-economic stability and/or generating fear.” The threat of an agroterrorist attack on American soil is a growing concern. The financial, political, and social consequences of an attack are potentially enormous. This article will help SOF medics increase their understanding of the risks and consequences of agroterrorism and the foreign animal diseases that pose a threat.

INTRODUCTION

Agriculture is part of America’s critical infrastructure. The safe and secure production of livestock and cultivated crops contribute to the social, economic, and political stability we enjoy in the United States. Agroterrorism is “the deliberate introduction of a disease agent into livestock herds [or cultivated food crops] for the purposes of undermining socio-economic stability and/or generating fear.”¹ The impact of such an act is potentially devastating. Yet, compared to the effort spent on other critical infrastructure such as transportation, the actions needed to prevent or respond to an agroterrorist attack have received comparatively little attention.²

The purpose of this two-part series is to increase awareness of animal-related agroterrorism and the foreign animal diseases that pose a threat. The discussion will be limited to animal-related diseases and will not cover plant-related diseases. Part I will discuss agriculture as a critical infrastructure, its vulnerabilities, and the potential impact of agroterrorism on our economy and human health. Part II will discuss foreign animal diseases that present the biggest risk to U.S. livestock.

What is the risk of an agroterrorist attack in the United States? Based on documents found in *al Qaeda* hideouts in Afghanistan in 2002, it appears that terrorists have identified our food production and supply system as a potential target.³ That same year, a Saudi cleric who supports *al Qaeda* issued a *fatwa*, or religious ruling, that sanctioned the use of weapons directed against crops and livestock.⁴ The extensive movement of animals across our borders magnifies the threat: on average, 38,000 animals enter the United States each day and 14 million are imported yearly.⁵ In addition to terrorist organizations with political motivations, other potential agroterrorists include state-sponsored terrorist groups, ideological

groups such as radical supporters of animal rights, and individuals hoping to gain financially by manipulating the financial markets or ruining a competitor.⁶

The following countries have a documented history of agricultural biowarfare programs: Canada, France, Germany, Iraq, Japan, South Africa, the Former Soviet Union, the United Kingdom, and the United States. Egypt, North Korea, Rhodesia, and Syria are suspected of having or having had agricultural bioweapons programs.⁷ State programs used – or attempted to develop the capacity to use – the following diseases offensively: anthrax, glanders, rinderpest, African swine fever, avian influenza, brucellosis, contagious bovine pleuropneumonia, contagious ecthyma (soremouth), foot-and-mouth disease, Newcastle disease, psittacosis, Venezuelan equine encephalitis, vesicular stomatitis, camelpox, eastern equine encephalitis, and western equine encephalitis.⁸ Part II of this series will discuss some of these diseases in more detail.

Despite the number of countries with agricultural biowarfare programs, few have actually carried out attacks on livestock. In World War I, Germany attempted to disrupt Allied transportation and supply lines by inoculating horses and mules with anthrax and glanders. Targeting animals intended for shipment from the United States, Argentina, and Morocco to Europe, they fed them contaminated sugar cubes or rubbed their muzzles with contaminated material. Little evidence exists that the attacks had any significant effect.⁹ Japan had an active offensive biowarfare program during World War II, primarily directed against Manchuria, where they allegedly used anthrax and rinderpest. Soviet forces allegedly used glanders during the Soviet-Afghan War in the 1980s.¹⁰ Some evidence indicates the Soviets tar-

geted Afghan guerrillas rather than, or in addition to, their horses.¹¹

The only documented attack against livestock by a non-state actor was for political gain; it used a toxin rather than a disease agent. In 1952, the Mau Mau, a nationalist liberation movement opposed to British rule in Kenya, used a toxic plant called the African milk bush to poison thirty-three cattle at a Kenyan mission station as part of a sabotage campaign.¹²

So is U.S. agriculture vulnerable to attack? Yes, according to several government and scientific reports.¹³ The reasons are multi-fold. Industrial practices that have done so much to create a commercial system capable of producing affordable food have increased the risk of “catastrophic disease and pest outbreaks.”¹⁴ The average American spends just 11% of disposable income on food, compared to as much as 50% for those in less developed countries.¹⁵ Farming practices in our country are concentrated and intensive. Large feedlots house up to 300,000 cattle. Chickens are raised in floor pens holding up to 20,000 birds.¹⁶ This concentration of livestock in confined areas increases the speed at which a disease can spread. In addition, the stress of living in such conditions increases the susceptibility of livestock to disease.

Current agricultural security and biosurveillance systems are inadequate, although recommendations for “hardening” the system exist.¹⁷ Reporting systems also contribute to the vulnerability of U.S. agriculture to attack, or at least to extensive spread of the disease prior to recognition. The current disease-reporting system is passive and inefficient, and is not linked to the human disease reporting system, although that is beginning to change. A trend toward reporting livestock statistics in aggregate rather than for individual animals has decreased incentives to observe the health of individual animals. In addition, agricultural producers are hesitant to report outbreaks of disease at their facilities because they worry they will not be compensated for the costs of culling or quarantining their livestock. Finally, there has been a decline in the number of veterinarians and veterinary technicians trained to recognize and treat foreign animal diseases.¹⁸

Not only is our agricultural infrastructure vulnerable to attack, but these vulnerabilities are easy to exploit. Again, the reasons are multi-fold.¹⁹ Agroterrorists have a large number of potential pathogens from which to choose. The Office International des Epizooties (OIE) (or World Organisation [sic] for Animal Health) has as one of its objectives: “To ensure transparency in the global animal disease and zoonosis situation.”²⁰ The OIE lists 115 diseases that member countries must report.²¹

These are communicable diseases that can affect the social, economic, or public health well-being of countries and that are important in the international trade of animals and animal products.²² The technology required to obtain and weaponize livestock pathogens is relatively unsophisticated. Many pathogens can be isolated from the environment. Many are environmentally hardy and cannot be transmitted to humans; these organisms would be especially easy to smuggle into the country with little personal risk to the terrorist. Because livestock vaccination programs in the U.S. do not routinely cover these diseases, herds and flocks are susceptible. Highly transmissible pathogens, of which there are many, simplify the weaponization issue because the livestock serve as the primary means for spreading the disease.

If the goal of a terrorist attack is to kill people, infecting the food chain is a low-tech way to do so. However, agroterrorism is more practical as a secondary attack meant to disrupt and weaken a society already traumatized by a conventional kinetic terrorist attack. This is because the effects of an attack on livestock will be scattered across the country and the impact will increase gradually; it will not have the media-grabbing impact of a single, explosive attack.²³

What would be the impact of an agroterrorist attack in the United States? Agriculture is part of America’s critical infrastructure.²⁴ Although farming employs less than two percent of the American population, about 16% of Americans work in an occupation directly supported by food production. Generating over one trillion dollars a year, agriculture accounts for about 16% of the U.S. gross domestic product (GDP).²⁵ Each year, cattle and dairy farmers earn over \$50 billion through the sale of milk and meat. The value of exported agricultural products totaled almost \$50 billion in 2001.²⁶ An attack on the agriculture infrastructure would have widespread social, economic, and public health consequences. Speaking at the second annual International Symposium on Agroterrorism in September 2006, FBI agent David Cudmore said, “[Terrorists] are not going to kill people with foot-and-mouth disease, but boy will they hit our pockets. We’d lose billions; it will almost cripple us economically.”²⁷

Costs from a large-scale agroterrorist attack come from several sources. First, there is the direct cost due to death or culling of animals. Second, there is the cost of containing the outbreak. Third, there is the economic loss due to a decreased demand or market for the agricultural product. Fourth, embargoes on export of products would decrease sales. Finally, revenue from tourism may suffer, as it did in England during the recent

outbreak of foot-and-mouth disease.²⁸ The overall effect would be a significant destabilization of the economic market.²⁹

The few documented cases of agroterrorism/biowarfare were limited in scope. To get some sense of the economic impact of a widespread outbreak, we turn to several recent cases of natural disease epidemics. An outbreak of classical swine fever in the Netherlands in 1997 required the slaughter of 8 million swine; the fiscal loss was \$2.3 billion (USD). That same year, an outbreak of foot-and-mouth disease in Taiwan also required the slaughter of 8 million swine.³⁰ The cost to diagnose and eradicate the disease was \$4 billion (USD) but the indirect loss from trade embargoes was \$15 billion (USD).³¹ The total cost of the well-publicized outbreak of foot-and-mouth disease in the United Kingdom in 2001, which included cases in France, the Netherlands, and Ireland, was about \$15 billion (USD)³² and required the slaughter of four million animals.³³ Economic models predict that the total cost of a similar outbreak of foot-and-mouth disease in the U.S. would be \$10-33 billion (USD).³⁴ Given the frequency of interstate transport of animals during the food production cycle, the U.S. Department of Agriculture estimates that an outbreak of foot-and-mouth disease would take just five days to reach twenty-five states.³⁵

In addition to economic costs, an agroterrorist attack is likely to have a human cost – beyond the emotional or mental hardship faced by those who suffer severe economic loss. An animal pathogen that can also infect humans (i.e., a zoonotic disease) may result in the spread of disease and death throughout the human population. A zoonotic disease that was introduced unintentionally in a previously unexposed population illustrates the potential for devastating consequences. Concurrent with the deaths of hundreds of birds in New York, New Jersey, and Connecticut in October 1999, seven people died of a viral encephalitis previously undiagnosed in the Western Hemisphere. At the time, few people connected the deaths of the birds with the human epidemic. This is one reason why public health officials recommend improving the integration of human and animal disease surveillance systems.³⁶ Since those initial cases, West Nile Virus has spread across the United States, with cases reported from all but seven states in 2006 (all but VT, NH, ME, RI, DE, NC, SC).³⁷ The epidemic peaked in 2003 with 9,862 cases and 264 deaths in the U.S. In 2006 (as of 17 Oct), there were 3,498 cases and 108 deaths in the U.S.³⁸ With news headlines such as “Public Panic Over West Nile Virus”³⁹; “Virus Panic Grips US East Coast”⁴⁰; and “U.S. Braces for Return of West Nile Virus”⁴¹, one can imagine the public reaction to a disease that infects both humans and their food supply. Even headlines designed to reassure – “West

Nile Virus Kills One – Do NOT Panic”⁴² – seem to spread alarm. No wonder officials preparing for an agroterrorist attack recommend training spokespeople how to communicate health risks appropriately.⁴³

An agroterrorist attack may also decrease the confidence of citizens in our government’s ability to protect the safety of the food supply. A sense of vulnerability and fear could provoke civil unrest and undermine support for the government. Controversial and emotionally disturbing control measures, such as mass culling of animals, could further destabilize the situation, as it did in England during the recent outbreak of foot-and-mouth disease.⁴⁴

SUMMARY

“At this time, the scope, scale, and consequences to human and animal health from zoonotic and agroterrorism threats are unprecedented.”⁴⁵ SOF medics should be aware of the risk of agroterrorism and the foreign animal diseases that pose a threat. This article discusses why agriculture is one of our critical infrastructures, the vulnerability of our food supply system to attack, and the potential impact of agroterrorism on our economy and human health. Part II will discuss foreign animal diseases that present the biggest risk to U.S. livestock.



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REFERENCES

1. Kelly, T.K., P. Chalk, J. Bonomo, J. Parachini, B.A. Jackson, G. Cecchine. “The Office of Science and Technology Policy Blue Ribbon Panel on the Threat of Biological Terrorism Directed Against Livestock,” RAND Office of Science and Technology Policy, April 2004, p. 3. (Available at http://www.rand.org/pubs/conf_proceedings/2005/CF193.sum.pdf).
2. Agroterrorism: What is the Threat and What Can Be Done About It?” Research Brief, Rand National Defense Research

- Institute, 2003. (Available at http://www.rand.org/pubs/research_briefs/RB7565/RB7565.pdf).
3. Collins, Susan M. "Agroterrorism: The Threat to America's Breadbasket," Hearing before the Committee on Governmental Affairs, U. S. Senate, November 19, 2003, p1. Available at <http://a257.g.akamaitech.net/7/257/2422/15jul20041200/www.access.gpo.gov/congress/senate/pdf/108hrg/91045.pdf>.
 4. Collins, Susan M. "Agroterrorism: The Threat to America's Breadbasket," Hearing before the Committee on Governmental Affairs, U. S. Senate, November 19, 2003, p2. Available at <http://a257.g.akamaitech.net/7/257/2422/15jul20041200/www.access.gpo.gov/congress/senate/pdf/108hrg/91045.pdf>.
 5. Apatow, Stephen M. "Agricultural Security and Emergency Preparedness: Protecting One of America's Critical Infrastructures." HRIBRL Discussion Paper ASEP-2001-12, Humanitarian Resource Institute, December 2001, p3. Available at <http://www.humanitarian.net/biodefense/papers/ASEP-2001-12.pdf>.
 6. Chalk, Peter. "Hitting America's Soft Underbelly: The Potential Threat of Deliberate Biological Attacks Against the U.S. Agricultural and Food Industry." Rand National Defense Research Institute, 2004, p27. Available at http://www.rand.org/pubs/monographs/2004/RAND_MG135.pdf.
 7. Monke, Jim. "Agroterrorism: Threats and Preparedness." Congressional Research Service Report for Congress, updated August 25, 2006, p15. Available at <http://www.nationalaglawcenter.org/assets/crs/RL32521.pdf>.
 8. CIDRAP, *Overview of Agricultural Biosecurity*, Center for Infectious Disease Research and Policy, University of Minnesota. Available at <http://www.cidrap.umn.edu/cidrap/content/biosecurit/ag-biosec/biofacts/agbioiovview.html>.
 9. Cameron, Gavin, Jason Pate, Kathleen Vogel. "Planting Fear," *Bulletin of the Atomic Scientists*, 57(5), September/October 2001, pp38-44. Available at http://www.thebulletin.org/article.php?art_ofn=so01cameron.
 10. Monke, Jim. "Agroterrorism: Threats and Preparedness." Congressional Research Service Report for Congress, updated August 25, 2006, p15. Available at <http://www.nationalaglawcenter.org/assets/crs/RL32521.pdf>.
 11. Alibek, Kenneth. *Biohazard*. New York: Random House, 1999, 268-269.
 12. Ban, Jonathan. "Agricultural Biological Warfare: An Overview," *The Arena*, No. 9, June 2000, pp1-8. Available at: <http://www.mipt.org/pdf/agrobiowarfareoverview.pdf>.
 13. Chalk, Peter. "Hitting America's Soft Underbelly: The Potential Threat of Deliberate Biological Attacks Against the U.S. Agricultural and Food Industry." Rand National Defense Research Institute, 2004. Available at http://www.rand.org/pubs/monographs/2004/RAND_MG135.pdf; Kelly, T.K., P. Chalk, J. Bonomo, J. Parachini, B.A. Jackson, G. Cecchine. "The Office of Science and Technology Policy Blue Ribbon Panel on the Threat of Biological Terrorism Directed Against Livestock," RAND Office of Science and Technology Policy, April 2004. Available at http://www.rand.org/pubs/conf_proceedings/2005/CF193.sum.pdf; Dyckman, Lawrence J. "Bioterrorism: A Threat to Agriculture and the Food Supply." Testimony given before the Committee on Governmental Affairs, U.S. Senate, November 19, 2003. Available at <http://www.gao.gov/new.items/d04259t.pdf>.
 14. Apatow, Stephen M. "Agricultural Security and Emergency Preparedness: Protecting One of America's Critical Infrastructures." HRIBRL Discussion Paper ASEP-2001-12, Humanitarian Resource Institute, December 2001, p8. Available at <http://www.humanitarian.net/biodefense/papers/ASEP-2001-12.pdf>.
 15. Kohnen, Anne. "Responding to the Threat of Agroterrorism: Specific Recommendations for the United States Department of Agriculture." BCSIA Discussion Paper 2000-29, ESDP Discussion Paper ESDP-2000-04, John F. Kennedy School of Government, Harvard University, October 2000, p1. (Available at http://bcgia.ksg.harvard.edu/BCSIA_content/documents/Responding_to_the_Threat_of_Agroterrorism.pdf).
 16. Apatow, Stephen M. "Agricultural Security and Emergency Preparedness: Protecting One of America's Critical Infrastructures." HRIBRL Discussion Paper ASEP-2001-12, Humanitarian Resource Institute, December 2001, p10. Available at <http://www.humanitarian.net/biodefense/papers/ASEP-2001-12.pdf>.
 17. Terrorist Threats to Food: Guidance for Establishing and Strengthening Prevention and Response Systems, World Health Organization, 2002. (Available at <http://www.who.int/foodsafety/publications/general/en/terrorist.pdf>).
 18. Chalk, Peter. "Hitting America's Soft Underbelly: The Potential Threat of Deliberate Biological Attacks Against the U.S. Agricultural and Food Industry." Rand National Defense Research Institute, 2004, p ix. Available at http://www.rand.org/pubs/monographs/2004/RAND_MG135.pdf.
 19. Chalk, Peter. "Hitting America's Soft Underbelly: The Potential Threat of Deliberate Biological Attacks Against the U.S. Agricultural and Food Industry." Rand National Defense Research Institute, 2004, p14-17. Available at http://www.rand.org/pubs/monographs/2004/RAND_MG135.pdf.
 20. Office International des Epizooties, *Objectives*. Available at http://www.oie.int/eng/OIE/en_objectifs.htm.
 21. Office International des Epizooties, *Diseases Notifiable to the OIE*. Available at http://www.oie.int/eng/maladies/en_classification.htm.
 22. Office International des Epizooties, *Old Classification of Diseases Notifiable to the OIE*. Available at http://www.oie.int/eng/maladies/en_oldclassification.htm.
 23. Agroterrorism: What is the Threat and What Can Be Done About It? Research Brief, Rand National Defense Research Institute, 2003. Available at http://www.rand.org/pubs/research_briefs/RB7565/RB7565.pdf.
 24. Monke, Jim. "Agroterrorism: Threats and Preparedness." Congressional Research Service Report for Congress, updated August 25, 2006, p20. Available at <http://www.nationalaglawcenter.org/assets/crs/RL32521.pdf>.
 25. Parker, Henry S. *Agricultural Bioterrorism: A Federal Strategy to Meet the Threat*. Institute for National Strategic Studies, National Defense University, McNair Paper 65; 2002:x. Available at: http://www.ndu.edu/inss/McNair/mcnair65/McN_65.pdf.
 26. Chalk, Peter. "Hitting America's Soft Underbelly: The Potential Threat of Deliberate Biological Attacks Against the U.S. Agricultural and Food Industry." Rand National Defense Research Institute, 2004, p4. Available at http://www.rand.org/pubs/monographs/2004/RAND_MG135.pdf.
 27. Adofo, Adjoa. "Hoof-and-mouth Peril Seen," The Kansas City Star, September 29, 2006. Available at <http://www.kansascity.com/mld/kansascity/news/local/15634323.htm>.
 28. Chalk, Peter. "Hitting America's Soft Underbelly: The Potential Threat of Deliberate Biological Attacks Against the U.S. Agricultural and Food Industry." Rand National Defense Research Institute, 2004, p20. Available at http://www.rand.org/pubs/monographs/2004/RAND_MG135.pdf.
 29. Dyckman, Lawrence J. "Bioterrorism: A Threat to Agriculture and the Food Supply." Testimony given before the Committee

- on Governmental Affairs, U.S. Senate, November 19, 2003, p4. Available at <http://www.gao.gov/new.items/d04259t.pdf>.
30. Apatow, Stephen M. "Agricultural Security and Emergency Preparedness: Protecting One of America's Critical Infrastructures." HRIBRL Discussion Paper ASEP-2001-12, Humanitarian Resource Institute, December 2001, p4. Available at <http://www.humanitarian.net/biodefense/papers/ASEP-2001-12.pdf>.
 31. CIDRAP, *Overview of Agricultural Biosecurity*, Center for Infectious Disease Research and Policy, University of Minnesota. Available at <http://www.cidrap.umn.edu/cidrap/content/biosecur/ag-biosec/biofacts/agbiooview.html>.
 32. Kelly, T.K., P. Chalk, J. Bonomo, J. Parachini, B.A. Jackson, G. Cecchine. "The Office of Science and Technology Policy Blue Ribbon Panel on the Threat of Biological Terrorism Directed Against Livestock," RAND Office of Science and Technology Policy, April 2004, p5. Available at http://www.rand.org/pubs/conf_proceedings/2005/CF193.sum.pdf.
 33. Dyckman, Lawrence J. "Bioterrorism: A Threat to Agriculture and the Food Supply." Testimony given before the Committee on Governmental Affairs, U.S. Senate, November 19, 2003, p4. Available at <http://www.gao.gov/new.items/d04259t.pdf>.
 34. Monke, Jim. "Agroterrorism: Threats and Preparedness." Congressional Research Service Report for Congress, updated August 25, 2006, p9. Available at <http://www.nationalaglawcenter.org/assets/crs/RL32521.pdf>.
 35. Dyckman, Lawrence J. "Bioterrorism: A Threat to Agriculture and the Food Supply." Testimony given before the Committee on Governmental Affairs, U.S. Senate, November 19, 2003, p4. Available at <http://www.gao.gov/new.items/d04259t.pdf>.
 36. Report of the WHO/FAO/OIE Joint Consultation on Emerging Zoonotic Diseases," World Health Organization, Geneva, Switzerland, 3-5 May 2004, p8. Available at http://whqlibdoc.who.int/hq/2004/WHO_CDS_CPE_ZFK_2004.9.pdf.
 37. Centers for Disease Control and Prevention, *2006 West Nile Virus Activity in the United States*. Available at <http://www.cdc.gov/ncidod/dvbid/westnile/Mapsactivity/surv&control06Maps.htm>.
 38. Centers for Disease Control and Prevention, *[West Nile Virus] Maps and Data*. Available at <http://www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm>
 39. Public Panic Over West Nile Virus," *American Butterflies*, Summer 2000. Available at <http://www.naba.org/wnvirus.html>.
 40. Virus Panic Grips US East Coast," *BBC News Online*, August 2, 2000. Available at <http://news.bbc.co.uk/2/low/health/866389.stm>.
 41. U.S. Braces for Return of West Nile Virus, *CNN*, June 25, 2003. (Available at <http://www.cnn.com/2003/HEALTH/06/24/sprj.wnv.preview/index.html>).
 42. West Nile Virus Kills One – Do NOT Panic," *LAVoice.org*, July 23, 2004. Available at <http://lavoice.org/index.php?name=News&file=article&sid=184>.
 43. Kelly, T.K., P. Chalk, J. Bonomo, J. Parachini, B.A. Jackson, G. Cecchine. The Office of Science and Technology Policy Blue Ribbon Panel on the Threat of Biological Terrorism Directed Against Livestock, RAND Office of Science and Technology Policy, April 2004, p11. Available at http://www.rand.org/pubs/conf_proceedings/2005/CF193.sum.pdf.
 44. Monke, Jim. "Agroterrorism: Threats and Preparedness." Congressional Research Service Report for Congress, updated August 25, 2006, p50. Available at <http://www.nationalaglawcenter.org/assets/crs/RL32521.pdf>.
 45. King, Lonnie J. "CDC Agroterrorism and Zoonotic Threat Preparedness Efforts." Testimony given before the Committee on Homeland Security Subcommittee on Prevention of Nuclear and Biological Attacks, U.S. House of Representatives, Athens, GA, August 24, 2006. (Available at <http://www.hhs.gov/asl/testify/t060824.html>).

A Novel Application of Hydrogel to Improve the Asherman Chest Seal® in a Deployed Environment

Farzad Nowrouzzadeh, MD

ABSTRACT

There are many challenges when practicing medicine in an operational environment. These challenges can be compounded with multiple traumatic injuries and extreme environments. The Asherman chest seal® has been issued to the U.S. Navy as a standard piece of medical equipment used to treat thoracic injuries. In the austere setting, there have been a number of case reports of the device failing to maintain a seal. By using an adhesive material called hydrogel, a water based polymer compound, with the chest seal, successful seal of penetrating chest wounds have been reported. This combination provides a way to improve the effectiveness and efficiency of medical personnel's live-saving gear.

Introduction

All SOF Corpsmen, Medics, PJs, and medical officers have to face challenges and adapt to their environment while providing optimal care for their Soldiers, Sailors, Marines, and Airmen in an operational theatre. One of the challenges faced in Operation Iraqi Freedom (OIF) is overcoming obstacles to bandaging and wound care in temperatures regularly greater than 100°F. This condition makes the patient, with long sleeve uniform and body armor, prone to perspiration. One problem medical personnel face is with the Asherman chest seal®, a standard piece of equipment for battalion aid stations

(BAS), used for the treatment of penetrating chest injury and pneumothorax. In an open pneumothorax, there is free communication through a chest wall wound between the pleural space and the atmosphere. Entry of air with each respiratory cycle results in progressive collapse of the ipsilateral lung. The larger the defect in the chest wall, the greater is the rate at which pleural air accumulates, and the more rapid is the collapse of the ipsilateral lung.¹ This pathophysiology is similar to that in tension pneumothorax because collapse of the lung and shift of the mediastinum to the opposite side will cause hypoxemia and decreased venous return. The traditional chest seal is an occlusive dressing intended to treat an open pneumothorax and preventing tension pneumothorax in chest injuries from gunshots, stab wounds, or other penetrating chest trauma (see Figure 1). On the Asherman chest seal®, the rubber one-way valve is located in the center and is designed to theoretically let air and blood escape while preventing re-entry of either. The seal is applied to the wound, and held there by a thin adhesive. With dry, clean skin, the chest seal maintains its adhesion.

On several reported occasions; however, the device did not maintain its seal when applied to bloody and, (many times) sweat-drenched skin, hair, and tissue, despite the use of gauze to dry the wound prior to application. In an operational environment where medical officers at Level 1 aid stations not only see poly-trauma to individual casualties, but multiple casualties simultaneously, it is pivotal to have equipment that can be relied upon to function properly. This point is even more stressed, as the medical evac-

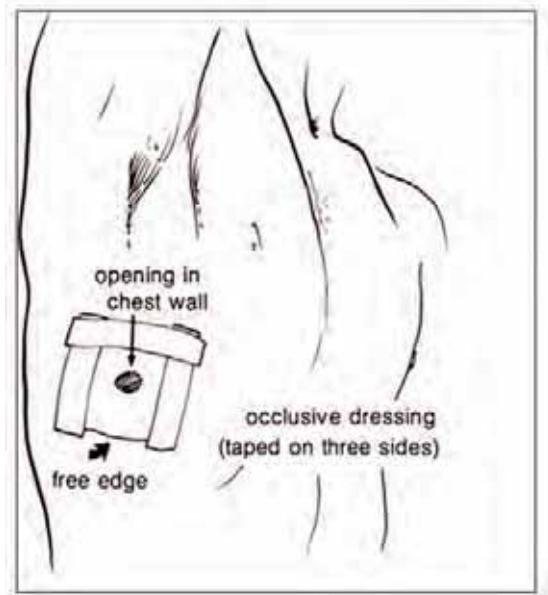


Figure 1

uation tempo has quickened, where patients are at Level 1 or Level 2 facilities for a few hours at most, and then transferred on to higher levels shortly thereafter.² This can make continuity of care difficult, and communication and turnover between medical units crucial. On two occasions this entailed Corpsmen substituting the standard chest seal with make-shift duct tape and applying it on as tightly as possible; however, this additional technique failed.

PRODUCT AND APPLICATION

There are two aspects of the chest seal that are problematic. First, poor adhesion on a wet, bloody body surface is a concern. Many times the injured are still actively bleeding from the chest injury. They may also have significant sweat, which adds to this. The standard chest seal has a thin adhesive, and when it becomes wet, it does not adhere well. This then makes additional work for the caretaker attempting to maintain the seal and use up additional equipment. Second, the relatively small surface area of the Asherman® makes multiple penetrating injuries difficult to close. The nature of multiple projectiles entering the thorax, causing multiple wounds, makes having a larger seal advantageous. Applying fewer dressings to cover more of the wound makes more efficient use of the gear available. A larger surface can also engage with adhesiveness by providing more area for contact between the intact surrounding skin and the chest seal.

Several Corpsmen in other operational units mentioned the use of hydrogel, an adhesive their units had originally used to apply explosives to doors and windows during clearing operations (i.e. part of the Breecher's tool kit).³ Hydrogels are three dimensional polymers that contain water. When coming in contact with water, it swells but maintains its chemical and adhesive properties and does not dissolve. The compound has a wide variety of uses, including drug delivery, wound care, biomedical hardware, and electrical applications during surgical procedures. A comparison made with other skin adhesives found it to be superior when used on skin for wound care.⁴ The form of hydrogel used came as a two sided adhesive, available in a blue tint, which allows good dependable adhesion to most surfaces encountered, including those dusty, wet, or asymmetric. Hydrogel appears to adhere better in heat, which seemed logical as the same material is used to apply EKGs leads to the skin, wound healing material, and electrical pacer pads for defibrillators. We decided to improvise and apply the Asherman chest seal® to the hydrogel film as shown (see Figures 2 to 7). After ordering an adequate



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7

supply for the BAS, we made enough improvised chest seals for the staff. An appropriately-sized hole (two centimeters in diameter) was cut out of the hydrogel to allow the one way rubber valve on the chest seal to function. The chest seal was then applied to the hydrogel. The area of the adhesive seal was increased from 5.5 inches in diameter to approximately 9.5 inches with the addition of the hydrogel as shown (Figure 3) to increase efficacy.

The Corpsmen made as many as they thought necessary, and carried them along with a few of the regular chest seals, in case there were unforeseen problems with the new seals. One Corpsman treated a penetrating shrapnel wound with the improved device, and it maintained its seal despite blood and clothing obstacles. The patient was subsequently transported to a Forward Resuscitative Surgical System (FRSS) – a small, mobile trauma surgical unit designed to support U.S. Marine Corps combat operations. These task-oriented surgical units have provided effective care to combat casualties.⁵ After evaluation and monitoring at the FRSS, the patient was returned to his unit with instructions to follow up and receive wound care at the BAS (see Figures 8a & b).

DISCUSSION

The Asherman chest seal® lined with hydrogel showed improvement in the applicability and usefulness of the device in a real time event. It is not foolproof however, as that with any acute penetrating thoracic trauma, there tends to be significant bleeding from the wound. This makes placement and successful sealing very difficult, regardless of what system you use, and may still require additional padding with tape. It is also not known whether removing the hydrogel is also more problematic, especially for the surgeon wishing to inspect or debride the wound depending on the scenario. Based on reports of its use on burns and wound healing, one might infer that it would not be a significant complicating factor. In fact, the combination might actually be providing better care by protecting the wound from dehydration and exogenous contamination. There may also be a point of view in the trauma community who feel that the chest seals issued currently shouldn't bother to have the one-way-rubber valve because of the valve frequently becoming clotted with blood. It may provide a false sense of security that a tension pneumothorax will not develop, and invite cavalier monitoring by the care-taker. This point would argue that placing the hydrogel seal by itself would be sufficient and comparable to the efficacy of the Asherman chest seal®. I never received a report that there was significant blood or air coming from the one-way valve by anyone who had used the improvised chest seal. Another important point to mention is the continued



Figure 8a Entrance wound



Figure 8b
Exit wound

need to monitor the patient, as a tension pneumothorax can still develop secondary to parenchymal lung injury, requiring needle decompression. The chest seal with the one-way valve does not substitute for needle decompression, but there have been published case reports of the Asherman® helping to stabilize and prevent dislodgement of needle thoracocentesis outside of a hospital setting.⁶ This might prove helpful in a combat environment where stable and deliberate patient movement may not be possible.

CONCLUSIONS

Given the nature of the combat environment of certain provinces in OIF, the high temperatures, and current logistics of medical evacuation, any improvement of the equipment should be encouraged. As long as medical inventories include the Asherman chest seal®, augmenting them with the hydrogel adhesive is beneficial, and could represent a future alternative.

The views expressed in this article are those of the author and do not necessarily reflect the official policy or

position of the Department of the Navy, Department of Defense, nor the U.S. Government.



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LT Nowrouzzadeh served as a battalion medical officer with the 2nd Marine Expeditionary Force out of Camp Lejeune, NC, from July 2004 to Jul of 2006. He deployed with the 2nd Marine Division to Iraq in support of Operation Iraqi Freedom (OIFIII) from 2005 to 2006. He served as the battalion surgeon for Headquarters Battalion, 2MAR-DIV in Ramadi, where he was the officer-in-charge of the battalion aid station. During his tour, he also served as the regimental surgeon for Regimental Combat Team-2, where he was involved in major combat operations including Operation Iron Fist and Operation Steel Curtain.

REFERENCES

1. Hall, Jesse B., Schmidt, Gregory A., Lawrence D.H. (2007). *Wood Principles of Critical Care, 3rd Edition*, Chapter 95. Torso Trauma, McGraw-Hill Company.
2. Gawande A. (2004). Casualties of war – military care for the wounded from Iraq and Afghanistan. *N Engl J Med*. Dec 9; 351(24):2471-5.
3. Hydrogel Ordering and Product Detail Information accessed at <http://www.amronintl.com/diving/products.cfm?id=2105>
4. Skelhorne G., Munro H. (2002). Hydrogel adhesives for wound-care applications. *Med Device Technol*. Nov;13(9):19-23.
5. Chambers L.W., Green D.J., Gillingham B.L., Sample K., Rhee P., Brown C., Brethauer S., Nelson T., Narine N., Baker B., Bohman H.R. (2006). The experience of the U.S. Marine Corps' Surgical Shock Trauma Platoon with 417 operative combat casualties during a 12 month period of operation Iraqi Freedom. *J Trauma*. Jun;60(6):1155-61.
6. Allison, K., Porter, K.M., Mason, A.M. (2002). Use of the Asherman chest seal® as a stabilization device for needle thoracostomy *Emerg Med J*;19:590–591.

Reviewer's Comment

I read the article “A Novel Application of Hydrogel to Improve the Asherman Chest Seal® in a Deployed Environment” and wanted to inform you we have been working with Teleflex Med, the producers of the Asherman, for about two years on this issue. We have finalized the improved version of the Asherman and the adhesive has been dramatically improved. We also addressed the size issue and after an initial fielding of the same sized 5” disk, there will be a 7” version fielded. So far, the new adhesive is outperforming anything that is now commercially available. This dressing will be assigned an NSN for military use and we have asked that they put it in an easy opening, mil-colored package. We are in the final phases of getting this to the guys; it should be within months. Realize that hydrogel in higher temps and humidity does not perform all that well. It tends to revert back to a very watery substance. I just used the older Asherman on my last trip and they failed terribly, no surprise. Also used the new Hyfin Chest Seal and these performed extremely well in very difficult conditions. I can send you a quick AAR on this case but don’t want to bore you. Our medics were initially carrying hydrogel as a replacement, but are now moving to Hyfins.

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Joint Special Operations Task Force - Phillipines (JSOTF-P)

Joint MEDCAP Planning

HMC Jody Fletcher, SFC John Dominguez, HM1 Travis Walker, HM1 Patrick Gallaher

"The Moro Islamic Liberation Front [MILF is a separatist organization in the Philippines] has described the latest approach to the insurgency problem in Mindanao....which is civil-military operations, as more lethal than brute force."¹

Executive Editor's Note: HMC Jody Fletcher, SFC John Dominguez, HM1 Travis Walker, and HM1 Patrick Gallaher are all to be congratulated for writing this article. I have never rejected an article written by medics. The number of articles in the JSOM authored by medics is only limited by the number we are sent.

ABSTRACT

Over the last several years civil military operations (CMO) have increasingly become a vital part of a commander's overall mission strategy. Special Operations Forces Medics help support a commander's CMO plan by planning, coordinating, and executing medical civil action programs (MEDCAPs). SOF Medics face unique challenges in planning and successfully executing MEDCAPs at the operational and tactical level of war. However, because of shared experiences in different combatant commands, civil affairs teams (CAT-As), and operational detachments alpha (ODAs) are developing successful tactics, techniques, and procedures (TTPs) for conducting MEDCAPs through a professional peer exchange within the JSOTF-P. The TTPs developed enable the CAT-A or ODA to immediately establish credibility, foster rapport, and improve contacts with local government units, local government organizations, non-government organizations, and host nation counterparts. The professional peer exchange provides the CAT-A or ODA team with the opportunity to learn the planning and logistical requirements of conducting a MEDCAP in the Joint Special Operations Task Force – Philippines AOR.

Marine Special Operations Company A (MSOC-A) was tasked with a new mission in the Republic of the Philippines. After only five weeks in the joint operational area (JOA) the MSOC-A was assigned the mission of conducting two MEDCAPs in two different barangays. (A barangay is the smallest unit of local government in the Philippines. It is a Filipino term for district or village.)

MSOC-A had to move medical supplies and people from more than thirteen different military and civilian organizations among several islands. CAT-As and ODAs have been conducting MEDCAPs in the Philippines for several years and unlike MSOC-A, generally have the advantage of conducting transition operations with outgoing teams to ensure continuity of effort.

The Corpsmen of MSOC-A are primarily Special Amphibious Reconnaissance Corpsmen (SARC), who

begin their training at the Field Medical Service School followed by the Basic Reconnaissance Course, Marine Combat Diver School, Amphibious Reconnaissance Corpsman Course, Basic Airborne School, and end with the Special Operations Combat Medic Course. The SARCs' medical training and tactical experience is equivalent to that of their counterparts in Special Forces, Civil Affairs, and Naval Special Warfare (NSW). Until recently, the opportunity did not exist for them to execute MEDCAP missions. Their recent entry into SOCOM and current deployment into the JSOTF-P's JOA illustrated one aspect of Special Operations that neither the MSOC-A, nor their Marine comrades had yet encountered – the non-kinetic fight.

The lack of experience in conducting MEDCAP operations led MSOC-A to quickly realize the need to search for subject matter experts in MEDCAP operations. Imme-

diately, the SARCs began searching for information and anyone who could help them accomplish their missions. The JSOTF-P's civil affairs planners offered assistance and referred them to the 97th Civil Affairs Company – the company then operating in the JSOTF-P JOA. The senior Medic for the CA Company was tasked with providing MSOC-A personnel with information on planning procedures and processes for MEDCAPs in this particular AOR.

In JSOTF-P JOA the mission is to work "by, through, and with" the Armed Forces of the Philippines (AFP), as described in the article, "A New Look on Military, Civil Military Operations"² by LT Johnson in the Journal of Special Operations Medicine. The article posits that operational success is measured by the AFP's ability to be self sufficient, with U.S. forces solely acting in advisory roles. MSOC-A was seeking this type of success and thus looked critically at the planning process performed by CAT-As in JSOTF-P's AO. The MSOC-A SARCs and the senior Medic for the JSOTF-P CA company reviewed the planning processes developed by the CAT-As for conducting MEDCAPS in the JOA and developed additional steps to further enhance the planning process. The results of their efforts improved the planning process and yielded a step-by-step planning model, which the JSOTF-P has adopted as the MSOC MEDCAP Model (3M).

What they discovered in their joint effort were minor shortfalls in the JOA's current MEDCAP planning process. Shortfalls identified included: the lack of a defined planning sequence; identifying host nation individuals and resources for the MEDCAP; and synchronizing efforts among all stakeholders. The shortfalls had not been identified earlier because information had not been disseminated throughout the JOA. The advantage of creating a planning model became readily apparent – it would support continuity of effort.



LtCol Bayong (6th Marine Battalion Commander AFP) interacts with children at MEDCAP as Col Alivio and SFC John Dominguez discuss joint training.

Photo by Marine Sgt Robert "Rocky" Smith



Chief Petty Officer Jody Fletcher, MSOC-A SARCs, and CA Medic participate in middle planning conference for MEDCAP with local leaders.

Photo by SFC John Dominguez



Petty Officer 1st Class Patrick Gallaher sutures wound at MEDCAP.

Photo by Petty Officer 1st Class Troy Latham



CSM Terry Peters, MSGT Sidney Voss, and SgtMaj Lustre (AFP) observe as Philippine marines and NGO's treat patients at MEDCAP.

MSOC-A conducted a successful MEDCAP on 7 May 2007 after utilizing the JSOTF-P planning model. Understanding that the patient load is historically twice the amount that was planned for, MSOC-A provided enough medicine for 250 patients. With supplies and additional medicine offered from local groups, and the combined effort of 13 different organizations, 475 patients, out of a populations of 2,644, were successfully seen and treated in less than a five-hour period of time. From the initial planning phase to its execution, there was little more than a two-week period in which to facilitate meetings and plan the operation. Though there is no single paradigm that can address all the questions encountered in planning and executing a MEDCAP, the model provided in this article can provide a valuable template for conducting a successful MEDCAP. See figures 1 to 3 and the outline of the MEDCAP model.

REFERENCES

1. <http://www.luwaran.com/modules.php?name=News&file=article&sid=249>.
2. LT Johnson, LT Mickaila, SFC James Shearer, and SFC Woodrow Wilson, "A New Look on Military, Civil Military Operations" – pending publication in the *Joint Special Operations Medical Journal*.

Initial Planning Conference (IPC)

Purpose: To initiate communication between U.S. forces and host nation (HN) (military, local leaders, non-government organizations, etc). This is when timelines and locations will be discussed in “broad stroke” terms.

WHO:

- 1) Unit level medical planner, someone who will see it through the execution phase.
- 2) HN, responsible command (CMO)
- 3) Local civil affairs office / civil military operations officer
 - a) Not required but beneficial

WHAT:

- 1) Tentative Date for: PDSS (if possible) /MEDCAP
- 2) Total number of personnel and transportation considerations
- 3) Request Numbers
 - a) Medical Personnel
 - Physicians
 - Dentists
 - Pediatricians
 - Pharmacists
 - Nurses
 - Midwives
 - Corpsmen/Medics
 - Dental Technicians
 - b) Others (i.e. CMO, Public Affairs)
- 4) Location
 - a) Grid location preferred
 - b) Inquire about previous MEDCAPs in or around proposed site
- 5) Supplies
 - a) Medical supplies that JSOTF will supply (i.e. MEDCAP Palette 250 / 500)
 - b) Any supportive, medical, or other supplies provided by HN assets
- 6) Personnel who will be in attendance for site survey
 - a) Solidify number of PAX
 - b) Obtain points of contact, phone numbers

(NOTE: Time of departure for Site Survey will be given at later date via Phone or email. Time is dependant on number of personnel and mode of transportation.)

- 7) Modes of transportation, from insert to MEDCAP.

- a) Host nation assets available and lift capacity
- b) U.S. Forces assets available and lift capacity

(NOTE: Ensure no less than a primary and alternative means of transportation for all personnel involved. Host nation assets can be unreliable)

WHEN: 2 Months - 1 Week from MEDCAP

WHERE: No specific location requirements

Middle Planning Conference (Site Survey)

Purpose: The site survey is when all coordination will cumulate to a final executable plan. All participating agencies will discuss the specifics of the operation and coordinate and finalize responsibilities, timeline, and exact number of participants from each agency.

WHO:

(NOTE: Photograph all key individuals and place into OPORD. DTG correct name.)

- 1) NGOs
- 2) PHO
- 3) HN CMO
- 4) HN CDR
- 5) HN U-7
- 6) Local governmental official (Barangay captain, village leader, mayor, etc)
- 7) Religious leader(s)
- 8) JSOTF
 - a) Military information support team (MIST)
 - b) Unit level planner
 - c) Security representative
 - d) (Optional) J-2, SIGINT, HUMINT
 - e) Civil Affairs

WHAT:

- 1) Local governmental official (Barangay captain, village leader, mayor, etc)
 - a) Estimated population
 - b) Number of households
 - c) Estimated number of registered voters
 - d) Confirmation of MEDCAP date
 - e) Publicize MEDCAP
 - f) Support for site
 - Tables
 - Chairs
 - Shade structures
 - Public address system
 - Water (For volunteers and tooth extraction)
 - Entertainment for waiting patients if possible
 - ice
 - cooler
 - fans
 - g) Religious leaders
- 2) Civil military operations officer (HN)
 - a) Clear and secure site 24 hours prior and maintain presence.
 - b) Confirms lunch for volunteers through local government.
 - c) Develops opening ceremony
- 3) NGOs
 - a) Confirm number of personnel and specific role of volunteers
 - b) Identify what supplies will be provided by each organization
 - c) Verify collection method (numbers for patients) and how / when information can be collected for AAR.
 - d) Facilitate transportation to and from site.

(NOTE: Facilitate communication between all NGO's and volunteers)

- 4) Provisional health officer / local health unit official

- a) Use of locals for registration
- b) Basic medical demographics by:
 - Age
 - Sex
 - Prominent medical conditions
- c) Confirm number of personnel that can be seen (Supplies being the limiting factor)
- c) Major concerns
 - Effect on economy?
- d) Number and type of medical personnel available to volunteer
 - Physicians
 - Dentists
 - Pediatricians
 - Dental Technicians
 - Corpsmen
 - Midwives
 - Nurses
 - Pharmacists

5) General concerns to be discussed

- a) Establish timeline of MEDCAP events
- b) Coordinate and confirm modes of, and timeline for transportation.
(NOTE: Anticipate delays, cancellation, and no-shows)
- c) Opening ceremony events developed and confirmed
- d) Walk through patient flow.
- e) Propose the registration form to be used

6) Site selection considerations

- a) Layout facilitates patient flow, mitigate congestion
 - Consider the pharmacy as the last stop before the exit
- b) Minimum of four rooms / partitions
 - Medical
 - Surgical
 - Dental
 - Pharmacy
 - Registration (Optional)
- c) Operational concerns (U.S. Forces)
 - Distance / transport time from insert to MEDCAP location
 - Field sketch of building layout
 - Photographs of buildings, avenues of approach, key terrain.
 - Ten digit grid of key locations
 - Hard room / Distinguished Visitor (DV) room
 - Easily defendable
 - Traffic concerns
 - Ingress / Egress routes
 - Management
 - Choke points
 - HLZs
 - CASEVAC
 - Emergency extract
 - Communications position/ equipment required

WHERE: Location should be the actual site of the MEDCAP. If unable to visit the actual site then the nearest military / host nation compound or area coordination center (ACC) should be utilized.

WHEN: 3 – 10 days prior to MEDCAP

Final Planning Conference (FPC)

Purpose: All events, transportation, and personnel will be confirmed and finalized

WHO:

- 1) Unit level medical planner, someone who will see it through the execution phase.
- 2) HN, responsible command (CMO)
- 3) Local civil affairs office / civil military operations officer
 - a) Not required but beneficial

WHAT:

- 1) Finalize and confirm
 - Total number of personnel by nation / service / position
 - Timeline of events
 - Transportation of all parties involved

WHEN: 24-48 hours post site survey.

WHERE: Same as IPC

Confirmation Brief

Purpose: Every U.S. Service member involved needs to attend

WHO: The following is a list of individuals and what they can provide

Public Affairs Office (PAO) – Positive information operations effectively targeting both host nation and U.S. audiences.
Combat Camera – Documentary photography submitted to joint services
Medical Personnel – Facilitate treatment
J-2 – Collections, HUMINT / SIGINT
MIST
Chaplain
Representative from unit providing transportation.

WHEN: 24 – 48 hours prior to execution of MEDCAP

Considerations:

- 1) Notify Special Operations surgical team (SOST) to be on stand-by
- 2) Plan on 2 to 10 DVs during planning
- 3) Prioritize manifest in anticipation of transportation changes.
 - Medical personnel are prioritized as per above.
- 4) Ensure and facilitate communication between ALL parties / personnel involved



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Use of Unapproved Products, Off-Label Use, and Black-Box Warning ... A Variation of Newton's Third Law or the Practical Application of the Rule of Unintended Consequences ... Considerations in Military Operational Medicine

Jerome F. Pierson, RPh, PhD

Executive Editors Note: As multiple medical research and development efforts (both in SOF and in conventional research units) offer new drugs and medical equipment to the battlefield, we need to understand the rules of engagement for use, which, are different for individual providers versus military health care systems.

ABSTRACT

This article discusses the regulatory requirements for the use of unapproved drugs and off-label use of drugs and provides specific examples for military medicine. Additionally, it explains issues associated with standardization by the Service as a designated set, kit, or outfit as opposed to a general guidance. The former situation can be interpreted as a de facto policy whereas the latter is an adaptation of practice of medicine.

Recent news stories brought to light the challenges facing military medicine in an environment where dramatic life-saving measures have become the expected rather than the exception.^{1,2} However, many of these same life-saving measures have the potential to place a practitioner in situations of “damned if you do, damned if you don’t” with regard to adherence to various regulatory and legal hurdles.

This paper is intended to help explain the regulatory issues associated with unapproved (investigational new drug – IND) products, off-label use of approved products, and the practical implications of black-box warnings on drug labels. Furthermore, specific examples will be described with regard to the application of the respective regulations. Finally, practical considerations will be discussed to guide practitioners as they wade through the medical-legal environment.

The Food and Drug Administration (FDA) regulatory processes for approval of new pharmaceuticals, biologics, and medical devices focus on the evaluation of these products from well-controlled clinical trials. The approval process for a new product or a labeling change to an approved product requires several years and several hundred million dollars.³ Furthermore, regardless of the exhaustive nature of the approval process, it is not perfect and has been

assaulted from many sides to include consumer groups who at times advocate for greater safety and at other times demand quicker access to therapeutic breakthroughs as well as the pharmaceutical industry which faces demands from stockholders for return on investment. Reliance upon results from controlled clinical trials is problematic in that it is difficult to derive a robust safety profile of a product due to the tight inclusion/exclusion criteria involved with an efficacy study. The FDA is well aware that when a product is introduced into the market place, the patient population will be anything but homogenous and the manner in which prescribers use the product will not necessarily reflect the labeled indications. In recent years, the FDA has addressed the potential blind spot associated with limited safety data through the requirement for additional post-marketing studies, also known as Phase IV studies, and reliance upon MedWatch reports submitted from practitioners.⁴ Regardless of these initiatives, the introduction of a pharmaceutical, biological, or medical device into a human host can be viewed as an application of Newton's Third Law: For every action, there is an equal and opposite reaction. The problem with the introduction of that pharmaceutical, biologic, or medical device is that it is difficult to know how that opposite reaction will manifest itself. Therefore, managing

medication related adverse events is often an exercise in the application of the law of unintended consequences. Consequently, various laws and regulations have been implemented over the years to address some of the potential problems that can arise when the best intentions of prescribing by policy can result in unintended consequences.

APPLICABLE LAWS, REGULATIONS AND POLICIES

Department of Defense policy regarding unapproved medical products (investigational new drugs – INDs) and off-label use of medical products in military operations emanate from 10 United States Code (USC) 1107,⁵ 21 Code of Federal Regulations (CFR) 50.23,⁶ and Department of Defense Directive 6200.2.⁷ For most practitioners, the laws and regulations are somewhat nebulous numbers that do not pertain to their practice environments. However, while the specific numbers associated with these laws and regulations may represent relatively low priority information in the context of required knowledge in order to treat patients, an orientation to the precepts of these documents will help the practitioner understand the basis for why the laws/regulations exist.

10 USC 1107 describes the basic legal requirements for the use of unapproved, investigational products in military operations. These requirements center around the need to inform recipients of the investigational or unapproved nature of the product provided, the reasons for prescribing, and the respective risks and benefits associated with the product. Furthermore, regarding any exception from informed consent requirements, the President is the approval authority. 10 USC 1107 reflects a Congressional recognition that when an IND product is the only means available to protect against a lethal chemical or biological weapon, the lives of individual members, the safety of their comrades who rely on them, and the success of the military operation may require uniform use of the medical protection. 21 CFR 50.23 (an FDA regulation) describes the procedures for review of the use of force health protection investigational products by the FDA and requirements for an Institutional Review Board (the Army Human Subjects Research Review Board – HSRRB). These reviews are required prior to implementation of any usage and prior to any requests through the Secretary of Defense to the President if a waiver of consent is requested.

In the BioShield legislation of 2004, Congress provided some relief to the many stringent requirements associated with investigational products and created a category known as the Emergency Use Authorization (EUA).⁸ The EUA allows the FDA to authorize the use of products that have not been fully approved in the event of a real or potential public health or military emergency if there is sufficient evidence to demonstrate safety and effectiveness. A

key consideration for the FDA is the balancing of the seriousness of the emergency against the body of knowledge of the risks and benefits of the proposed product. For example, EUA approval for a product with a known safety profile that is in Phase III clinical trials for use in a fatal disease pandemic represents one end of a spectrum for FDA evaluation as compared to a novel product that has yet to be introduced in humans. Of note with the EUA is that the FDA also evaluates the information to be provided to healthcare providers on how to use the product and the information to be provided to recipients of the product. Furthermore, in the absence of a Presidential waiver, recipients are to provide consent approved by the FDA to receive the product. However, the consent does not necessarily need to be approved by an institutional review board as the FDA research rules do not typically apply for EUAs.

The EUA is different from an emergency use of an investigational product for the treatment of an individual patient or for the conduct of emergency research. The FDA has specific provisions to allow for an investigational product to be used in an emergency situation when that product represents the only potential life-saving intervention.^{9,10} These are distinctly different situations where in one case, an unapproved drug or device may represent an intervention of last resort. The other situation involves a deliberate effort to conduct a well controlled trial with an investigational product where the study involves enrolling research participants who cannot provide their own consent due to the nature of their illness or injury.¹¹ Both of these situations will be briefly discussed later in this paper.

Another consideration for healthcare providers is the language in Department of Defense Directive (DoDD) 6200.2. DoDD 6200.2 states that “DoD Components shall make preferential use of products approved by the FDA for general commercial marketing, when available, to provide the needed medical countermeasure.” DoDD 6200.2 goes on to describe the requirements for using unapproved products and off-label products for force health protection. Key in this description is the definition of force health protection, “an organized program of healthcare preventive or therapeutic treatment, or preparations for such treatment, designed to meet the actual, anticipated, or potential needs of a group of military personnel in relation to military missions.” The practical take home point from DoDD 6200.2 is the differentiation between practice of medicine and force health protection when it comes to off-label prescribing. Practice of medicine is the interaction between a provider and his/her patient based on a personal knowledge of the medical history and needs of a specific patient. Off-label use of prescription products in the practice of medicine is not regulated by the Food and Drug Administration. The FDA regulation on investigational products specifically

states that the document “does not apply to the use in the practice of medicine for an unlabeled indication of a new drug approved under part 314 or of a licensed biological product.”¹² However, misadventures associated with off-label prescribing in the practice of medicine are open game to the legal community.

The practice of medicine often evolves faster than the capacity of the regulatory-laden approval process for prescription products. The practice of medicine often advances after publication of research results from randomized controlled trials reporting new ways in which approved products can be effective. In organized settings, these research results are often collated and organized into clinical practice guidelines as evidence-based medicine in an attempt to provide the best possible healthcare solutions for patients and reduce variation in the delivery of care. However, in most institutions, the clinical practice guideline is not viewed as a rote policy, but as a guide to allow the practitioner to assess the needs of the specific patient according to guidance derived from the current knowledge on that particular condition and the available products to treat that condition. Clinical practice guidelines are written for a particular disease or injury set, and it is often difficult to identify the constellation of co-morbid conditions that can accompany the guideline, thereby requiring the practitioner to exercise clinical judgment when assessing the evidence when prescribing to their patients according to guidelines.

An additional term that has more of a medical-legal basis for consideration is the “black-box warning.” A black box warning means that the FDA has determined that the drug carries a significant risk of serious or even life-threatening adverse effects. In addition to seeing an actual black box enclosing the warning on the approved package insert, the FDA usually requires the pharmaceutical company to send out a “Dear Doctor” letter to warn prescribers of the potential risk and any cautions with regard to patient monitoring. The reason this term has more of a medical-legal connotation is that if a patient has a medical misadventure with such a product, and the prescriber was not following the cautions listed within the black box, than the patient’s lawyer will have little difficulty in justifying a malpractice claim made on behalf of that patient.

SPECIFIC EXAMPLES AND PRACTICAL CONSIDERATIONS

Several examples will illustrate the application of the terms described above.

First, with regard to force health protection, the array of vaccinations provided to Service members at entry to active duty represents the classic example of the prescribing by policy an organized program of preventive medicine. When the anthrax vaccine experienced legal challenges to the FDA approval status a few years ago, the

FDA pulled the approval status. The DoD went through the process of identifying the potential emergency situation that existed for the use of anthrax as a biological weapon and submitted an EUA request to the FDA. The FDA allowed the use of the anthrax vaccine on a voluntary basis for those individuals who consented to receive the product. Fortunately, the controversy surrounding the approval status of the anthrax vaccine was resolved and the product is available for administration.

Regarding off-label use of an approved product, media attention was drawn to the use of recombinant factor VIIa for the treatment of severe bleeding in trauma casualties in Iraq.¹ The product, also known commercially as Novo-Seven®, is approved for the treatment of bleeding in hemophilia.¹³ While the use of the product was outside the labeled indications, the introduction of the product into the military trauma environment was not based on a DoD policy position. Trauma surgeons in theater who were familiar with the most recent literature documenting positive results from the use of recombinant factor VIIa in trauma used a practical evidence-based medicine approach to establish local clinical practice guidelines for damage control resuscitation that were consistent with the austere nature of the environment and the recognition that early use in the trauma facility was associated with less need for massive transfusions and consistent with more positive outcomes.¹⁴⁻¹⁷ Regardless of the complexity of the cases treated with recombinant Factor VIIa, the use of the product was open game for media attention (and subsequently the sub-title of the application of Newton’s Third Law). However, the same undesirable media attention provided an avenue to explain to the Congressional leadership the challenges associated with military medicine and the shortcomings associated with over-interpretation of well intended laws and regulations.

Related to the question of off-label use is the relationship of the black-box warning and the labeled indication for fentanyl lozenges (Actiq®). The fentanyl lozenge is indicated only for the management of breakthrough cancer pain in patients with malignancies who are already receiving and who are tolerant to opioid therapy for their underlying persistent cancer pain.¹⁸ A request for stockage of this product in Special Forces aide bags resulted in considerable discussion regarding two aspects of the use of the product. These were the specific nature of the approved label and the intended level of prescribing. Regarding the limited indication, the approved label is a function of the environment for which clinical trials were conducted to obtain product approval. Conducting research in chronic pain to get a product onto the market is much more straightforward with regard to the regulatory burden of conducting research in the acute care environment, where obtaining

consent is a difficult proposition. Furthermore, the economic incentive for a company to obtain the kind of clinical data to justify the expanded labeling represents another hurdle as the clinical experience of practitioners with a product like fentanyl is substantial, as the product has been on the market for decades in the injectable dosage form. This means that studying the specific use of fentanyl (lozenges) by Special Operations Medics in the field represents little to no incentive to the company. Regardless, the therapeutic ratio with the product is relatively narrow and a substantial number of medication misadventures have been associated with its use resulting in the black box warning on the package insert that states:

including this product in the aide bag. Special consideration in the area of troops has to be with the training and experience of each medic with regard to the anticipated clinical experience they would need in making use of this product, as well as any other non-standard product added to the bag. Furthermore, in addition to the normal clinical planning/decision making factors, the organization does need to recognize that the product requires substantial accountability / control procedures to minimize the risk of diversion and abuse.

With regard to the use of an unapproved product in an emergency situation, U.S. Army physicians in Iraq have used a German made product, the Novalung interventional

WARNINGS: IMPORTANCE OF PROPER PATIENT SELECTION and POTENTIAL FOR ABUSE

ACTIQ contains fentanyl, an opioid agonist and a Schedule II controlled substance, with an abuse liability similar to that of other opioid analgesics. ACTIQ can be abused in a manner similar to other opioid agonists, legal or illicit. This should be considered when prescribing or dispensing ACTIQ in situations where the physician or pharmacist is concerned about an increased risk of misuse, abuse or diversion. Schedule II opioid substances which include morphine, oxycodone, hydro-morphone, oxymorphone, and methadone have the highest potential for abuse and risk of fatal overdose due to respiratory depression.

ACTIQ is indicated only for the management of breakthrough cancer pain in patients with malignancies who are already receiving and who are tolerant to opioid therapy for their underlying persistent cancer pain. Patients considered opioid tolerant are those who are taking at least 60mg morphine/day, at least 25mcg transdermal fentanyl/hour, at least 30mg of oxycodone daily, at least 8mg oral hydromorphone daily or an equianalgesic dose of another opioid for a week or longer.

ACTIQ is intended to be used only in the care of cancer patients and only by oncologists and pain specialists who are knowledgeable of and skilled in the use of Schedule II opioids to treat cancer pain.

Because life-threatening hypoventilation could occur at any dose in patients not taking chronic opiates, ACTIQ is contraindicated in the management of acute or postoperative pain. This product **must not** be used in opioid non-tolerant patients.

Patients and their caregivers must be instructed that ACTIQ contains a medicine in an amount which can be fatal to a child. All units must be kept out of the reach of children and opened units properly discarded.

The concomitant use of ACTIQ with strong and moderate cytochrome P450 3A4 inhibitors may result in an increase in fentanyl plasma concentrations, and may cause potentially fatal respiratory depression.

Such a strongly worded label represents a considerable challenge to any exercise in rationalizing the standardized use of the product. However, the Special Forces medicine environment is different from any clinical setting that can be envisioned by representatives from industry, the FDA, and most of the other providers in military medicine. As such, the relationships that exist between the Special Forces surgeon and the physician extenders under their responsibility are drastically different from traditional military medicine organizations. Furthermore, by regulation, the Special Forces Medic may be indirectly supervised by their respective medical officer. The Special Forces surgeon and the patients under his or her responsibility would be best served through the evaluation of the situation under a METT-T type planning factor where a standard evaluation on a case by case basis is made for each mission before

lung assist device, as a measure of last resort in a few patients with acute respiratory distress syndrome subsequent to concussive lung injury. The use of this product followed procedures outlined by the FDA which include:

- Informed consent from the patient or a legal representative when feasible. The consent of the patient may not be possible, and the consent of a legal representative may be a function of the reliability of communication channels.
- Clearance from the institution as specified by their policies. An a priori determination by the respective medical leadership in theater was provided.
- Concurrence of the IRB chairperson within five-days of the use of the device. For the use of the device in Army facilities in Iraq, the Brooke Army Medical Center served as the IRB of record and current com-

munication channels should suffice.

- An independent assessment from an uninvolved physician. This occurred prior to use of the product and was documented in the patient medical record.
- Authorization from the IDE sponsor. Novalung® GmbH has provided the Department of Defense with authorization to use the product as an emergency IDE.

These regulatory requirements may appear to represent a hurdle to overcome the use of an unapproved product in an emergency situation. However, there are offices within the U.S. Army Medical Research and Materiel Command (USAMRMC) that have sufficient expertise to facilitate the appropriate use should the need arise. The USAMRMC Office of Research Protections and the Force Health Protection Office of the U.S. Army Medical Materiel Development Activity can help the practitioner reduce the labyrinth of regulations into an exercise in the appropriate documentation of clinical care.^{19,20}

The FDA hurdles for use of an investigational product in an emergency setting for one specific patient are not as high as they are with the conduct of clinical research. Furthermore, it is important to recognize that the FDA does not look at these regulations as an avenue to provide early access to an investigational product for more than one patient. If a practitioner anticipates needing a product for several patients, they are required to go through the process of obtaining an investigational drug approval or an investigational device exemption from the FDA. This situation leads to the discussion of the practical limitations of conducting research under the FDA regulations for emergency research. The conduct of emergency research under FDA regulations during military operations is not a practical reality for obtaining data to support the marketing application of a drug or device.²¹ The concept of conducting a controlled-clinical trial under the FDA's good clinical practice standards is counter-intuitive to the nature of the provision of care in the relatively uncontrolled environment of military medicine in a combat setting. While there is no absolute prohibition from conducting such a study, there are several practical considerations for the well-intentioned researcher. First, the personnel resources required to conduct the study, collect the data, monitor the data, and maintain control over the investigational product goes outside the normal staffing of a healthcare facility engaged in the provision of care. Adding these personnel has the potential to create undue stress on an already challenging environment and creates additional burdens for the theater of operations with regard to security, transportation, and housing to name just a few. Furthermore, before such a study can begin, the approval process could require more than a year to obtain the appropriate Service Secre-

tary approval.

The last example describes a situation in which a patient requires the use of a foreign anti-venom for treatment of either snake or scorpion venom poisoning. The U.S. Army Medical Research and Materiel Command (USAMRMC) filed a blanket IND with the FDA for the use of foreign anti-venoms. Additionally, the FDA basically views this IND as a pseudo-emergency IND and requests in-turn from the Army reports of very basic information such as the name of the anti-venom used, the source of the anti-venom (i.e., name of manufacturer, lot number) and outcome information from the use of the product. The Central Command established a procedure for reporting such episodes to the USAMRMC to assist in the regulatory compliance with the minimal FDA requirements.²²

TARGET FOCUS

Special operations medics are often the end-users of the medications that are being studied for off-label use. Therefore it is incumbent on the researchers keep this in mind at the outset of a study or examination of a product. Unlike civilian, and to some extent typical military medicine, Special Operations medicine is continually pushing the envelope on what can be done by non-physician medical personnel. Many times this occurs in environments that would have been considered impossible in the past. Therefore, when determining the safety of a medication used for applications other than that for which it was approved, strict adherence to closely observed protocols is of paramount importance. Without this, there is no way to evaluate the effectiveness of the medication.

For instance, in the observational study regarding the use of the fentanyl lozenge noted above, the clinicians supervising the use of this drug maintained a strict adherence to the protocols set forth before it was used. The black box warning given by the FDA was clearly daunting but all involved recognized that the warning did not directly apply to the population being studied. Fentanyl is a drug that causes respiratory depression at a given blood level and could become a very real concern if used by patients of their own accord while not being supervised. Rarely is this the case in special operations medicine since patients often have some form of observation following an injury. During the initial study, if observation was not possible, the study protocol indicated that the drug should not have been used.

At the end of the day, novel use of medications and medical devices are examined with a focus on saving lives. Medics at the point of injury are critical in the success of this endeavor and all clinicians considering the off-label use of a medication need to assume that, eventually, it will make it into the hands of a medic and craft the protocol accordingly.

FOR THE MEDICS

This article is salient for non-physician medical providers in that it illustrates the complexity of the approval process that is taken by providers when using a drug for a condition other than that for which it was intended. Every medic dispensing medications to a patient should have a clear understanding of the pharmacology of that medicine. This is especially true in the case of off-label or novel uses.

Current Special Operations medical personnel are faced with an FDA black-box warning for the use of Actiq lozenges. This should not be taken as a mandate for preventing its use, rather it should be used to reinforce that the medic understand the potential problems and thus, be prepared. In doing so, there is a heightened awareness that will certainly lead to a minimal amount of complications.

TAKE HOME POINTS

This paper scratches the surface with regard to the many issues associated with the regulatory and legal challenges associated with investigational and off-label use of products. A constant that can be applied to these situations is that there is no constant – each application represents a unique and differing aspect of military medicine. Therefore, the following generalized take home points that equip the practitioner to appropriately discern the complexities of these issues may represent a more useful tool than specific advice or guidance.

- The FDA approval process provides evaluation of product efficacy and safety in the intended population stated on the label. Therefore, much of what is known about a product is discovered in the post-marketing phase when it becomes available to a larger, more heterogeneous population of patients from across all age ranges, ethnic groups, and comorbid conditions. Industry needs appropriate incentives to conduct the expensive clinical trials necessary to support expanded indications. Fortunately, Novo-Nordisk is in the process of evaluating the efficacy of recombinant Factor VIIa in trauma in an international multi-center trial. Unfortunately, it will take several years to complete this complex study.
- Physicians have a personal responsibility for keeping current in the practice of medicine and for using critical evaluation of information from literature from randomized controlled trials. Care should be taken with regard to generalization of results from well-controlled trials and especially from anecdotal reports. Therefore, establishing consensus panels to establish general clinical practice guidelines represents a deliberate, orderly approach of evi-

dence-based medicine to expanding the use of a product in a controlled fashion without making the use part of a larger policy dictating what every patient should receive. Under the clinical practice guideline approach, the practitioner has the leverage to apply the guideline based on their experience and the unique characteristics of what each patient presents.

Special operations medics undergo extensive screening and training before being allowed to act as medical extenders in the austere and/or combat environments. We expect them to act with a high level of maturity and with a full understanding of the medications they are using. It is up to the unit surgeons and physician assistants to ensure that the medics are qualified to use any drug, especially one with potentially serious adverse effects.

Adding products for an unapproved use to sets, kits, and outfits represents a defacto policy and should be avoided as the approval process is long and challenging. If a product is needed for off-label use, the military medical supply channels are capable of providing a non-standard basis and furthermore, the non-standard acquisition shows the American public that it was the clinician who actively asked for the product to be available rather than a universal policy that made that product available for the care of the patient.

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REFERENCES

1. Little R. Dangerous remedy. Baltimore Sun, 2006; November 19-21.
2. Murray B. Unauthorized medical device keeps Soldier alive. Stars and Stripes, 2005, June 15.
3. DiMasi, Hansen, Grabowski, and Lasagna. (1995). Research and development costs for new drugs by therapeutic category. A study of the U.S. pharmaceutical industry. *PharmacoEconomics*, Feb;7(2):152-69.
4. FDA Form 3500, MedWatch, The Food and Drug Administration Safety Information and Adverse Event Reporting Program, October 2005.
5. 10 USC 1107. Notice of use of an investigational new drug or a drug unapproved for its applied use.
6. 21 CFR 50.23. Food and Drug Administration, Protection of human subjects, Exception from general requirements.
7. Department of Defense Directive 6200.2, Use of Investigational Drugs for Force Health Protection; 2000, August 1.
8. DoD Authorization Bill, 2004. Section 564 of the act (21 U.S.C. 360bbb-3), as amended by the Project BioShield Act of 2004 (Public Law 108-276).
9. 21CFR312.36. Food and Drug Administration, Investigational New Drug, Emergency use of an IND.
10. <http://www.fda.gov/cdrh/devadvice/ide/early.shtml#emergencyuse>.
11. 21CFR50.24. Food and Drug Administration, Protection of human subjects, Exception from informed consent requirements for emergency research.
12. 21CFR312.2(d). Food and Drug Administration, Investigational New Drug, Applicability.
13. Novo-Seven®. Novo Nordisk, FDA approved prescribing information, version 10, 13 October 2006.
14. Kenet G, Martinowitz U. (1999). Treatment of traumatic bleeding with recombinant factor VIIa; *Lancet*.
15. JTTS Clinical Practice Guidelines for Damage Control Resuscitation at Level IIb and III.
16. FDA mandated Novo-Nordisk warning letter to Healthcare professionals, dated 23 November 2005.
17. Perkins JG et al. Early versus late recombinant factor VIIa in combat trauma patients requiring massive transfusion, Presented at AAST, September 2006.
18. Actiq®. Cephalon, FDA approved prescribing information, 2007.
19. Office of Research Protections, U.S. Army Medical Research and Materiel Command (DSN 343-2602, commercial 301-619-2602).
20. IND Force Health Protection Office, U.S. Army Medical Materiel Development Activity (DSN 343-3773, commercial 301-619-3773).
21. International Conference on Harmonisation for the Registration of Pharmaceuticals for Human Use, Guideline for Good Clinical Practice. Federal Register, 9 May 1997.
22. U.S. Central Command / MNC-I Policy for Antivenins Lacking U.S. Food and Drug Administration Approval, 7 July 2006.

**HEADQUARTERS
MULTI-NATIONAL CORPS - IRAQ
BAGHDAD, IRAQ
APO AE 09342**

FICI-MD

7 July 2006

MEMORANDUM FOR See Distribution

SUBJECT: CENTCOM / MNC-I Policy for Antivenins Lacking U.S. Food and Drug Administration Approval

1. REFERENCES.

JCS Campaign Analysis Report U-145,017-02, 8 October 2002, "Venomous Snakes and Scorpions in Iraq, and Their Antivenin Sources"

AR 40-3, Medical Dental, and Veterinary Care, 12 November 2002

AR 40-7, Use of Investigational Drugs and Devices in Humans and the Use of Schedule I Controlled Drug Substances, 4 January 1991

AR 40-38, Clinical Investigation Program, 1 September 1989

21 U.S. Code, Chapter 9, The Federal Food, Drug, and Cosmetic Act of 1938 with amendments.

10 U.S. Code, Subtitle A, Part II, Chapter 55, Section 1107, Notice of Use of an Investigational New Drug or a Drug Unapproved for its Applied Use, 5 Jan 99.

21 CFR 50, Protection of Human Subjects, April 1, 2004.

Executive Order 13139, Improving Health Protection of Military Personnel Participating in Particular Military Operations, September 30, 1999.

21 CFR 50 & 312, Human Drugs and Biologics; Determination That Informed Consent is NOT Feasible or is Contrary to the Best Interests of Recipients, October 5, 1999.

DoD Directive 6200.2, Use of Investigational New Drugs for Force Health Protection, August 1, 2000.

2. PURPOSE. Establish the theater policy for the management, use, and reporting requirements of investigational antivenins.

3. APPLICABILITY. All military and civilian personnel under the operational or tactical control of CENTCOM & MNC-I.

4. Background. Highly poisonous pit vipers, cobras, and scorpions can be found in almost every habitat in the CENTCOM region. Military forces deployed to Iraq are at risk for venomous snakebites and scorpion stings. Seven venomous snake species and four venomous scorpion species found in Iraq are capable of inflicting life-threatening wounds. The snakes are well-camouflaged and when cornered or stepped on, these snakes are remarkable for the speed with which they strike. Their bites are responsible for many deaths throughout the region. Untreated snakebites can cause convulsions, paralysis, hemorrhage, and death. Scorpions hide in protected places. Favored sites are under rocks, wooden boards, in old tires, utility boxes, tentage, laundry piles, and debris piles. Their venom affects the nervous system. The most appropriate treatment for significant snake or scorpion envenomation is species-specific antivenin administered by trained medical personnel. Because the venomous snakes and scorpions found in Iraq are geographically different from other species the unique antivenins used to treat envenomation are not U.S. Food and Drug Administration (FDA) approved products. They are therefore classified as investigational new drugs by the FDA. Normally this classification would require the development of an investigational protocol directing the explicit conditions and manner of use of these agents in patient care. Their use would also require informed consent. The FDA has granted a "blanket waiver" of the IND requirements on the use of these antivenins and has instead placed some unique reporting requirements on their use.

5. Policy and Procedures.

a. **Stocking.** The unique, non-FDA approved antivenins required for treatment of snake or scorpion envenomation will only be stocked by Level 3 facilities within the CENTCOM AOR. Exceptions to this policy must be requested and justified to the CENTCOM Surgeons Office delegated to the P& T Committee. If a snakebite or scorpion envenomation occurs, identify the snake or scorpion if possible (kill it, do not attempt to capture it) and transport the victim immediately to the nearest Level 3 medical facility. Proper treatment of envenomation victims can only be provided by a physician and patients must be closely monitored during this treatment. Patients are at high risk for hypovolemic shock, renal impairment, and bleeding due to envenomations as well as immediate and delayed hypersensitivity reactions from the antivenins.

(1) These antivenins should be ordered and stocked only by the pharmacy service of the Level 3 MTF. The pharmacy services have personnel trained in the management of investigational new drugs (INDs) and proper preparation of doses.

(2) The pharmacy services in theater operate a communications network to ensure rapid replacement of used or expiring antivenin products.

b. **Ordering.** The investigational antivenins must be ordered only through USAMMC-SWA or USAMMCE. The pharmacy staff officers in these units have the data on each unique product and its source of supply. The following products are INDs that may be required for use in SWA:

(1) 6505-08-139-1423, Polyvalent Snake Antivenin, 10ml, 10s (FAVIREPT) for puff adder (*Bitis arietans*), whitebelied saw-scaled viper (*Echis leucogaster*), Egyptian cobra (*Naja haje*), black-necked spitting cobra (*Naja nigricollis*), desert-horned viper (*Cerastes cerastes*), and Sahara viper (*Microviper deserti*). Due to the limited coverage, Favirept will be procured as the **alternate** snake antivenom when other products are not available.

(2) 6505-08-139-1452, Polyvalent Snake Antivenom (Equine), 10ml, 10s from the National Antivenin & Vaccine Production Center in Saudi Arabia, for Desert Black Snakes and Cobras including *Bitis arietans*, *Cerastes cerastes*, *Echis carinatus*, *Echis coloratus*, *Naja haje*, *Walterinnesia aegyptia*. The antivenom also neutralizes hemorrhagic and myonecrotic activities of viper venoms and the neuromuscular blocking and cardiotoxic effects of elapid venoms. It has a wide spectrum of activity and can neutralize venom of many Middle East and North African snakes including *Bitis caudalis*, *Bitis gabonica*, *Naja melanoleuca*, *Naja naja*, and *Naja nigricollis*.

(3) Razi Polyvalent Snake Antivenin, 10ml, 10s from RAZI Vaccine & Serum Research Institute, Tehran, IRAN for *Echis carinatus*, *Vipera lebetina*, *Vipera albicornuta*, *Pseudocerastes persicus*, *Naja naja oxiana*, and *Agkistrodon halys* venom with phenol as preservative. Razi Antivenin contains the most commonly shared venomous snake in this geographic region and should be the first line of antivenin therapy.

(4) 6505-08-139-1255, Polyvalent Scorpion Antivenin, 1ml, 20s (SCORPIFAV) for fattailed scorpion (*Androctonus australis hector*), death stalker (*Leiurus quinquestriatus*), no common name (*Buthus occitanus mardachei*).

(5) 6505-08-140-1520, Polyvalent Scorpion Antivenom (Equine), 1ml, 10s from the National Antivenin & Vaccine Production Center in Saudi Arabia, for Saudi yellow scorpion (*Leiurus quinquestriatus*) and black scorpion (*Androctonus crassicauda*). The antivenom also has a wide spectrum of activity and can neutralize the venoms of many middle East and North African scorpions including *Buthus arenicola*, *Buthus minax*, *Buthus occitanus*, *Leiurus quinquestriatus hebraeus*, and *Androctonus amoreuxi*.

c. **Distribution and Storage.** These antivenins must be distributed under cold chain managed, refrigeration conditions and must never be frozen. All persons involved in the storage or distribution of these antivenins must ensure maintenance of refrigeration cold chain at all times. The Cold Chain Management Guide should be consulted for information on packing and shipping if movement of these products is required. The authorized stock levels are described in Table 1.

TABLE 1

Product Name	Facility Name											
	CSH Bucca	CSH Abu	CSH Mosul	CSH Tikrit	CSH Baghdad	CSH Tallil/ Al Asad	332d Balad	Navy Kuwait	ROK Irbil	14th Bagram	376 Kyrgyzstan	
Scorpifav Scorpion Species Anti Venom	20	20	20	20	20	20	20	20	0	20	0	20
Polyvalent Scorpion Antivenin Equine Serum	4	10	20	20	20	20	20	20	10	20	0	0
Polyvalent Snake Antivenin Equine Serum	20	20	20	20	20	20	20	20	10	20	0	0
Favirept Fragments Equine Antivenin	0	0	0	0	0	0	0	0	0	0	0	0
Razi Polyvalent Snake Anti-venin	20	20	20	20	20	20	20	20	0	20	10	10
Affinity Purified, European Viper Antivenom (Viper Tab)	0	0	0	0	0	0	0	0	0	0	0	0
Polyvalent Snake Antivenin (different NSN)	0	0	0	0	0	0	0	0	0	0	0	0

d. **Control and Accountability.** Because these antivenins are IND products they must be managed in the same manner as controlled substances. Each vial or ampoule is an accountable unit of issue. All receipts and expenditures must have justifying documentation (either an MRO for a receipt or a physician's order or a turn-in document for dispensed or expired product). Maintain a perpetual inventory and provide documents to the monthly controlled substances inventory officer during routine inspections.

e. **Dispensing and Preparation.** When known envenomations occur and one of these products is ordered by a physician the pharmacy service will dispense the required amounts for patient administration. If product preparation is required follow the product labeling instructions. Pharmacy will sign doses over to the administering nursing or physician personnel using appropriate documentation.

f. Administration.

(1) **General.** Nursing or physician personnel administering one of these products must ensure total dose is documented in the patient record and matches the dose ordered by the physician, and prepared and dispensed by the pharmacy.

(2) **Supportive Therapy.** IV fluid administration to support hemodynamic stability (i.e., normal blood pressure and maintain urine output) is an essential element of treatment.

(3) **Monitoring.** The patient's coagulation status must be monitored due to hemotoxicity of some venoms. When severe envenomation is suspected based on signs and symptoms, treatment with antivenin should be initiated. Before initiation of antivenin therapy educate the patient on the indication for antivenin treatment and document the patient's consent to treatment in the medical record.

(4) **Antivenin administration.** Administration of antivenins must be closely monitored due to potential for hypersensitivity reactions. Greater than 10% of patients treated with antivenin may develop immediate allergic reactions. Keep epinephrine 1:1000 injection, 1ml and diphenhydramine 50mg/ml injection, 1ml available for anaphylactic shock. Consider administration of a TRIAL DOSE of antivenin (0.2ml of antivenin intradermally and observe for 30 minutes) to assess likelihood of anaphylaxis. Also consider prophylactic administration of diphenhydramine 50mg IV to reduce or prevent the likelihood of reactions to antivenin administration. Patients must be closely monitored for appropriate physiologic responses to the antivenin use.

(5) Adjunctive therapy.

- (a) Blood products may be required if severe coagulopathies develop.
- (b) Provide analgesics (NO NSAIDS or steroids) to reduce pain and inflammation.
- (c) Update patient's tetanus vaccination status.

(d) Educate the patient about the possibility of delayed serum sickness.

g. **Reporting.** Use of one of these IND antivenins requires specific reporting. To ensure reporting can be easily completed ensure treatment is fully documented in the patient record. For each case when one of these products is ordered the following information must be provided to the Pharmacy Service:

- (1) Full Name and Rank of the patient.
- (2) Branch of service of the patient.
- (3) Last 4 of the SSN of the patient
- (4) Antivenin product used.
- (5) Quantity of product used (number of vials and total number of ml or total dose).
- (6) Patient's clinical outcome from the treatment.
- (7) Provider name, rank, last 4 of the SSN, and unit identification.

This data must be forwarded by the pharmacy service to the USAMMC-SWA or USAMMCE pharmacy staff officer. It is essential to provide these data as justification for reordering. These organizations will not provide additional stocks of these products to MTFs unless either this report is provided or stocks of one of these antivenins have expired. The USAMMC-SWA or USAMMCE pharmacy staff officers have the responsibility to pass these reports to the U.S. Army Medical Research and Materiel Command's Chief of Regulatory Affairs. The Chief of Regulatory Affairs is required to report all use of these products to the FDA.

h. USAMMCE pharmacy staff officer: MAJ Jorge Carrillo, DSN 314-495-7230, e-mail: jorge.carrillo@us.army.mil.

i. USAMMC-SWA Pharmacy Staff Officer: CPT Joseph Taylor, DSN 318-432-2883, e-mail: joseph.r.taylor@qatar.army.mil

6. The point of contact for this policy is LTC Guillermo Quiles, MNC-I Pharmacy Consultant, DSN 318-822-2416, e-mail: guillermo.quiles@iraq.centcom.mil.

DISTRIBUTION:

MNF-W	MNB-N
MND-N	MND-B
MND-SE	30 th MED BDE
CENTCOM P&T Committee Members	



The Fentanyl QA Project: An RFI for cases of use of the Actiq Fentanyl Lozenge

SOF medical personal have been leading the way in field pain control for some time now. This has predominantly involved the use of the “pill pack” and the use of the Actiq Fentanyl lozenge for acute pain relief. This use of Fentanyl is an off-label indication of the lozenge, which is approved only for the use of breakthrough pain in patients on long term use of narcotics (such as cancer patients). The use of medication off-label is a common practice and can always be done at the discretion of the prescribing MD. We have been utilizing Fentanyl this way both effectively and safely for several years since the first use of it in OIF in 2003. We have not; however, done a very good job of keeping track of our use of Fentanyl, its effectiveness, or the side effects encountered.

This has become more important recently due to the FDA black box warnings on the use of other (non lozenge) formulations of Fentanyl off-label. This QA project is being undertaken to determine how effective Fentanyl has been for us and the incidence of side effects seen with its use. This is a collaborative effort by the command surgeons of multiple SOF units and USSOCOM. By collecting this QA we can answer any questions that may arise in our use of Fentanyl. Thus should an issue ever arise regarding our off-label use of the lozenges we can show how we have safely and effectively utilized it. As one of the early users of the Fentanyl lozenge, I believe in its use and collecting this data will enable us to continue to do so in the future.

We would request that anyone who has utilized Fentanyl lozenges fill out a retrospective QA form on every use they can recall. The demographic information of age, date, theater, and command surgeon is to allow me to separate cases and prevent duplicates. By listing your command surgeon, I can separate cases by units with that information rather than using unit names or other designators. Do provide all the side-effect information you encounter, we expect a certain amount, and not finding any, will suggest the data is biased (for example, we would expect at least 40% of users to have some nausea). Also include any uses on allies and indigenous personal. This will be both a retrospective and prospective QA data collection, so send in any old cases of use, as well as any present uses.

There are several ways you can get the information to me. By email at Ian.Wedmore@amedd.army.mil or wedmorei@msn.com, send it to your command surgeon who can forward it to me, or mail it to me at:

COL Ian Wedmore
5206 Tower Dr NE
Tacoma WA 98422
or
COL Ian Wedmore
Department of Emergency Medicine
Madigan Army Medical Center
Tacoma WA
98431

Please submit every case of use you can recall as this will help ensure our continued ability to utilize Fentanyl lozenges for acute pain relief. This data is being collected for QA purposes and is protected as such

LTC Russ Kotwal, LTC Tim Talbot, LTC Robert Lutz, LTC Andre Pennardt, LTC Trey Mosley, CPT Cord Cunningham, COL Rocky Farr, and COL Ian Wedmore are all involved in and support this QA project.

Fentanyl Lozenge QA project

Date used (Month/year at a minimum):

Theater (OEF or OIF):

Your command Surgeon:

Patient Age:

Patient Sex:

Injury:

Pre Fentanyl pain score (1-10)[Medical providers assessment]

Post Fentanyl Pain score (1-10)[Medical providers assessment]
(At peak effect after medication)

Side effects: Nausea
 Emesis
 Pruritis
 O₂ Desaturation

Any complication requiring narcan?

Any complication requiring supplemental oxygen?

Any other complications?

Total Fentanyl dose given:

Any Concomitant medications of any type given:

Follow up?

ABSTRACTS FROM CURRENT LITERATURE

The Diagnostic Accuracy of 64-Slice Computed Tomography Coronary Angiography Compared with Stress Nuclear Imaging in Emergency Department Low-Risk Chest Pain Patients

Michael J. Gallagher, MD, Michael A. Ross, MD, Gilbert L. Raff, MD, James A. Goldstein, MD, William W. O'Neill, MD, Brian O'Neil, MD

Annals of Emergency Medicine, Volume 49, Issue 2, Pages 137-143.e1 (February 2007)

Abstract

Study objective: We compared the accuracy of multidetector computed tomography (CT) coronary angiography with stress nuclear imaging for the detection of an acute coronary syndrome or 30-day major adverse cardiac events in low-risk chest pain patients. **Methods:** This was a prospective study of the diagnostic accuracy of myocardial perfusion imaging and multidetector CT in low-risk chest pain patients. The target condition was an acute coronary syndrome (confirmed >70% coronary stenosis on coronary artery catheterization) or major adverse cardiac events within 30 days. Patients were low risk by Reilly/Goldman criteria and had negative serial ECGs and cardiac markers. All had both rest/stress sestamibi nuclear imaging and multidetector CT. Patients with abnormal stress nuclear imaging results (reversible perfusion defects) or multidetector CT results (stenosis >50% or calcium score >400) were considered for cardiac catheterization, and those with discordant results had a greater than 30-day reevaluation (including ECG) by a cardiologist. All were followed up for evidence of major adverse cardiac events within 30 days by review of hospital records and structured telephone interview. Primary outcomes were the accuracy of multidetector CT and myocardial perfusion imaging for the detection of an acute coronary syndrome and 30-day major adverse cardiac events. **Results:** Of the 92 patients, 7 (8%) were excluded because of uninterpretable multidetector CT scans. Of the remaining 85 study patients (49±11 years, 53% men), 7 (8%) were found to have the target condition, with all having significant coronary stenosis (88%±9%) and none having myocardial infarction or major adverse cardiac events during 30 days. Stress nuclear imaging results were negative in 72 (85%) patients, and multidetector CT results were negative in 73 (86%) patients. The sensitivity of stress nuclear imaging was 71% (95% confidence interval [CI] 36% to 92%), and multidetector CT was 86% (95% CI 49% to 97%), and the specificity was 90% (95% CI 81% to 95%) and 92% (95% CI 84% to 96%), respectively. The negative predictive value of stress nuclear imaging and multidetector CT was 97% (95% CI 90% to 99%) and 99% (95% CI 93% to 100%), respectively, and the positive predictive value was 38% (95% CI 18% to 64%) and 50% (95% CI 25% to 75%), respectively. **Conclusion:** The accuracy of multidetector CT is at least as good as that of stress nuclear imaging for the detection and exclusion of an acute coronary syndrome in low-risk chest pain patients.

Four-Extremity Gangrene Associated with Crack Cocaine Abuse

Saurabh S. Dhawan, MD, Benjamin W.E. Wang, MD

Annals of Emergency Medicine, Volume 49, Issue 2, Pages 186-189 (February 2007)

Abstract

A 43-year-old woman with a history of cocaine abuse presented with decreased mental responsiveness and cyanosis of the extremities several hours after repeated use of "crack" cocaine. She developed bilateral hand compartment syndrome requiring emergency fasciotomy and gangrene of both hands and legs despite anticoagulant and antithrombotic therapy. Digital and above-knee amputations were performed. There was no evidence of an autoimmune disorder or vasculitis on laboratory evaluation and tissue histology. Peripheral vasospasm may have been the mechanism of toxicity in this case, and the use of intravenous vasodilators should be considered as potential additional therapy.

ProTECT: A Randomized Clinical Trial of Progesterone for Acute Traumatic Brain Injury

David W. Wright, MD, Arthur L. Kellermann, MD, MPH, Vicki S. Hertzberg, PhD, Pamela L. Clark, RN, Michael Frankel, MD, Felicia C. Goldstein, PhD, Jeffrey P. Salomone, MD, L. Leon Dent, MD, MSCR, Odette A. Harris, MD, Douglas S. Ander, MD, Douglas W. Lowery, MD, Manish M. Patel, MD, Donald D. Denson, PhD, Angelita B. Gordon, MS, Marlena M. Wald, MPH, MLS, Sanjay Gupta, MD, Stuart W. Hoffman, PhD, Donald G. Stein, PhD

Annals of Emergency Medicine, Volume 49, Issue 4, Pages 391-402.e2 (April 2007)

Abstract

Study objective: Laboratory evidence indicates that progesterone has potent neuroprotective effects. We conducted a pilot clinical trial to assess the safety and potential benefit of administering progesterone to patients with acute traumatic brain injury. **Methods:** This phase II, randomized, double-blind, placebo-controlled trial was conducted at an urban Level I trauma center. One hundred adult trauma patients who arrived within 11 hours of injury with a postresuscitation Glasgow Coma Scale score of 4 to 12 were enrolled with proxy consent. Subjects were randomized on a 4:1 basis to receive either intravenous progesterone or placebo. Blinded observers assessed patients daily for the occurrence of adverse events and signs of recovery. Neurologic outcome was assessed 30 days post-injury. The primary safety measures were differences in adverse event rates and 30-day mortality. The primary measure of benefit was the dichotomized Glasgow Outcome Scale—Extended 30 days post-injury. **Results:** Seventy-seven patients received progesterone; 23 received placebo. The groups had similar demographic and clinical characteristics. Laboratory and physiologic characteristics were similar at enrollment and throughout treatment. No serious adverse events were attributed to progesterone. Adverse and serious adverse event rates were similar in both groups, except that patients randomized to progesterone had a lower 30-day mortality rate than controls (rate ratio 0.43; 95% confidence interval 0.18 to 0.99). Thirty days post-injury, the majority of severe traumatic brain injury survivors in both groups had relatively poor Glasgow Outcome Scale—Extended and Disability Rating Scale scores. However, moderate traumatic brain injury survivors who received progesterone were more likely to have a moderate to good outcome than those randomized to placebo. **Conclusion:** In this small study, progesterone caused no discernible harm and showed possible signs of benefit.

Personality Influences on a Two-Man Arctic Expedition, Impact on Spouse, and the Return Home

Leon, Gloria R.; Scheib, Andrea

Aviation, Space, and Environmental Medicine, Volume 78, Number 5, May 2007 , pp. 526-529(4)

Abstract

Introduction: Two men engaged in a kayak/sled Arctic expedition and their wives were evaluated. This report focuses on personality factors and decisions on the ice, psychosocial effects on those left behind, and the family re-integration process. **Method:** Pre-expedition measures included the Multidimensional Personality Inventory (MPQ) and the Personal Assessment of Intimacy in Relationships (PAIR). Semi-structured interviews were conducted post-expedition and at a 4-mo follow-up. The PAIR was re-administered at the 4-mo follow-up. **Results:** Significant tension and lack of communication between the two expeditioners was reported in response to the leader's decision to terminate the expedition because of weather conditions and poor progress. The incompatibility of the personality traits and goals of the two expeditioners contributed to this tension. The wives provided positive social support to each other, although the support and concern of their community became stressful. For each couple, both positive and negative changes in partner relationship intimacy were evident at the 4-mo follow-up. There was little consistency between each spouse on the types of changes that occurred. **Discussion:** Greater attention to and planning for the re-integration process is suggested, with application for the return from other types of challenging endeavors.

Consecutive Field Trials Using Two Different Intraosseous Devices

Ralph J. Frascone, MD, FACEP, Joe P. Jensen, RN, NREMT-P, Kory Kaye, MD, FACEP,
Joshua G. Salzman, MA, EMT-B

Prehospital Emergency Care, 2007;11 :164-171

Abstract

Objective: Establishing traditional intravenous (IV) access in adult trauma and medical patients can be difficult. We evaluated provider performance for obtaining intraosseous access with two FDA-approved intraosseous devices (F.A.S.T. 1™ and EZ-IO®) in two sequential field trials. **Methods:** One hundred twenty-four providers consented to participate in the first field trial evaluating the use of the F.A.S.T. 1™ system. Three hundred eighty-nine providers consented to participate in the second field trial, evaluating the use of the EZ-IO®. Following each insertion attempt, a telephone data collection process with a member of the research team was completed. Insertion success rate and measures of provider comfort and satisfaction with each device were collected and analyzed. **Results:** One hundred seventy-eight insertions (89 F.A.S.T. 1™ ; 89 EZ-IO®) were completed between February 2000 and December 2005. Sixty-four of the 89 insertions of the F.A.S.T. 1™ were successful, and 78 of the 89 insertions of the EZ-IO® were successful (72% vs. 87%; $X^2 = 6.8$; $P = 0.009$). Providers using the F.A.S.T. 1™ attempted more IV insertions prior to using the IO device than the providers using the EZ-IO® (2.6 vs. 2.0, $P = 0.005$). There were no differences in provider comfort or provider assessed device performance between the two devices ($p = 0.52$; $P = 0.13$, respectively). **Conclusion:** In our comparison of two field trials of prehospital provider use of the F.A.S.T. 1™ and EZ-IO® systems, more successful insertions with the EZ-IO® were achieved than with the F.A.S.T. 1™ device. Limitations of our comparison include nonrandomization, the sequential field trial design, the potential for a learning effect, and self-reporting of data points by providers. A prospective, randomized evaluation of these devices is warranted to draw definitive conclusions about provider insertion success rate with these devices.

Central Venous Access by Air Medical Personnel

Daniel P. Davis, MD Prasanthi Ramanujam, MD

Prehospital Emergency Care, 2007;11:204-206

Abstract

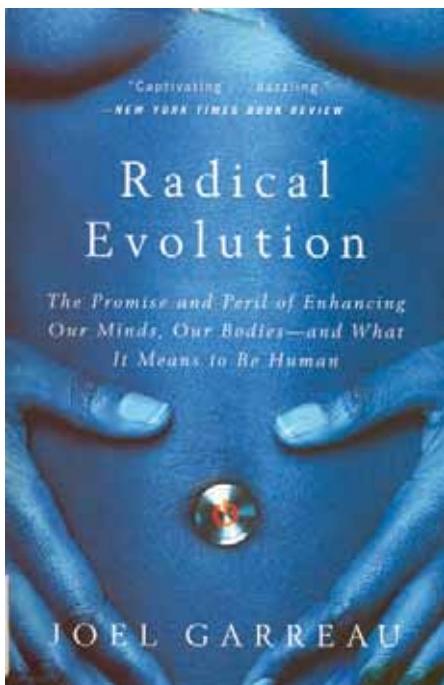
Background: Vascular access is vital in the resuscitation of critically ill and injured patients for both fluid resuscitation and the delivery of medications. However, peripheral access is not always possible in patients with hypovolemia or difficult anatomy. Central venous access is an alternative vascular access strategy for air medical crews, offering the advantage of relatively predictable anatomy, even in unstable patients. The success and complication rates for the procedure in the hands of flight air medical personnel must be considered in the decision to institute a central venous access procedure. **Objective:** To explore success and complication rates for central venous access attempts in patients treated by air medical crews. **Methods:** This was a retrospective review using advanced procedure quality improvement forms. All air medical patients in whom an attempt at central venous access was made over a 3D-month period were included. Femoral and subclavian lines were compared for incidence, success rates, and complications. **Results:** A total of 50 patients were identified over the 3D-month study period. The incidence of femoral and subclavian attempts was approximately equal. The overall success rate was 66% (60% for subclavian, 67% for femoral, and 73% for nonspecified site). The mean number of attempts was 1.2 for each approach. The only reported complication was an arterial placement during a subclavian attempt. **Conclusions:** We observed moderate success rates and a low incidence of reported complications with air medical central venous access attempts.

= Book Reviews =

Radical Evolution: The Promise and Peril of Enhancing Our Minds, Our Bodies – and What It Means to Be Human

Garreau, Joel. Broadway Books: New York, 2005. Paperback, pp. 385. ISBN 0-7679-1503-8.

Review by Warner D. Farr



We steadily move forward on human performance enhancement — just look at the column in the rear of this journal. Whether anyone wants to get on board or not, the train is moving and most all of our Soldiers, Sailors, Airman, and Marines are on it. Just stand outside the GNC next to the Post or Base Exchange sometime and count the supplement sales. Some of this is generational; the older folks, read — Commanders, tend to have a knee jerk response of “NO, don’t use anything.” To be fair, not all of them are that way, but many are. It is an area they are mostly uncomfortable with and their lack of understanding results in a decision to just not try to understand and just to outlaw by fiat. Many are uncomfortable with anything, even mere multivitamins, much less, more aggressive unproven supplements. With the many forms of human enhancement that are becoming routine -- sports rehabilitation, psychotropic drugs, wakefulness enhancers, cosmetic surgery, sexual performance

drugs — there is a lot to become uncomfortable about. Just wait for super-intelligent machines, non-aging bodies, direct connections between human brains, or brains and computers, really realistic virtual reality, and patient reanimation from cryonic suspension. If you have someone who wants to stretch their boundaries and look way down the road, this is the book for them. It is not an in-depth read for the believers, but a revelation for the unknowing. Joel Garreau is a *Washington Post* reporter and takes the uninitiated on a tour of possible futures by interviewing scientists and future thinkers concerned with the implications of our new knowledge of the genome. He uses five scenarios:

First, the Curve Scenario — where information technology improves exponentially, progress bleeds into genetics, robotics, and nanotechnology. In one subbranch, the Singularity Scenario, it leads, before 2030, to the creation of greater-than-human intelligence, improving itself at such a rate exceeding comprehension. Humanity no longer worries about procuring food, disease becomes outdated, mortality gives way to human/machine hybrids that can live for hundreds, if not thousands, of years.

Second, Heaven — where we are stronger and healthier, live longer, and metabolize food more efficiently. It shows a future of unimaginable good: conquered disease, no poverty, but also an increase in “beauty, wisdom, love, truth, and peace.” Humans become gods with immortality from nanotechnology and genetic research. Computers are developed with the power of hundreds of human brains. Life is good.

Third, Hell — science unchecked, genetic crippling of our food and infants with unexpected deformities as we search for improved characteristics. Almost unimaginably, bad things might happen with large portions of the human race or the biosphere being destroyed at a fast pace. Worries go from direct threats to human survival, to the subtle ways in which our quest for technological mastery could

undermine the foundations of human dignity. Perhaps a small class of people genetically engineers babies, turn traditional humans into slaves, with technology spiraling out of control polluting the planet.

Forth, Prevail – a scenario that manages to slow potential harm and speed up potential benefits. People will use the emerging technology to strengthen the connections between individuals. Humanity will change, change is essential, but we keep that “nebulous essence that makes each of us human.”

The last scenario, Transcend – offers that humans might actually conquer the difficulties and emerge into a new age beyond our wildest dreams. One of my complaints about this book is that these possible futures are not well divided and are they mutually exclusive? He does do a good job of focusing on what it will all mean for humans. He also ignores the energy costs of this transformation.

In the final chapter he asks, “Will we forever keep mum about our obviously intense desire to break the bonds of mortality? Or should we lift the taboo and start dealing with it?” He clearly, and somewhat simplistically, thinks yes.



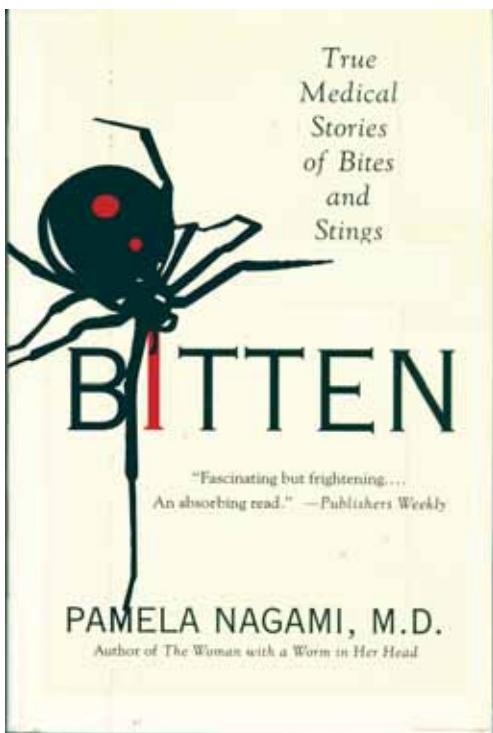
"I was wondering when you'd notice there's lots more steps."

Bitten: True Medical Stories of Bites and Stings

Pamela Nagami.

St. Martin's Griffin: New York, NY. ISBN: 0312318235. Paperback. 368 pages.

Review by Warner D. Farr



We are all taught in medic or medical school (or with some of us, in both) that all bites are not the same. This book shows this in spades and at the same time was a great and fun read! The author presents various case studies of infections contracted from ants, spiders, mosquitoes, ticks, various other insects and also from such larger animals as Portuguese man-of-war, venomous snakes, rats, alligators, dogs, cats, other family pets (ferrets), garfish, komodo dragons, horses, donkeys, seals, monkeys, and humans.

It turns out seal bites perplexed medical science for many years – go figure. Unknown to me, “seal fin-

ger” is a malady painful enough for seal hunters to amputate their own fingers for relief. These various sting and bite stories turn into discussions of various diseases and some into medical detective stories, both from how to save a patient’s life to seeking development of anti-venom or to finding the animal spreading a particular disease. Several chapters included information on what the reader should do when confronted by certain animals (for example: tips on safe tick removal and effective treatment for cat and dog bites).

The fire ant causes more trouble than one would expect. Cattle starve when fire ants render their food inaccessible, thousands of trout have been found dead from venom poisoning after eating swarms of winged ants that had flown into lakes, and fire ants, attracted to the warmth of heated asphalt, have caused road collapse as they built mounds beneath them. Spiders are still incompletely understood with enzymes in their venom that attack and dissolve cell membranes and may result in autoimmune responses leading white blood cells to dissolve a victim’s flesh. I learned a new term “necrotic arachnidism.” Other diseases covered include; sleeping sickness, leishmaniasis, West Nile virus, and tick paralysis.

A final section looked at animals that pose a danger from teeth and claws and from the infection caused by these wounds. Included are chapters on alligators, crocodiles, komodo dragons, dogs, cats, ferrets, rats, donkeys, camels, horses, garfish, seals, roosters, owls, monkeys, other wildlife that spread rabies, and human bites. There is a whole chapter on the viciousness of ferrets, especially to infants.

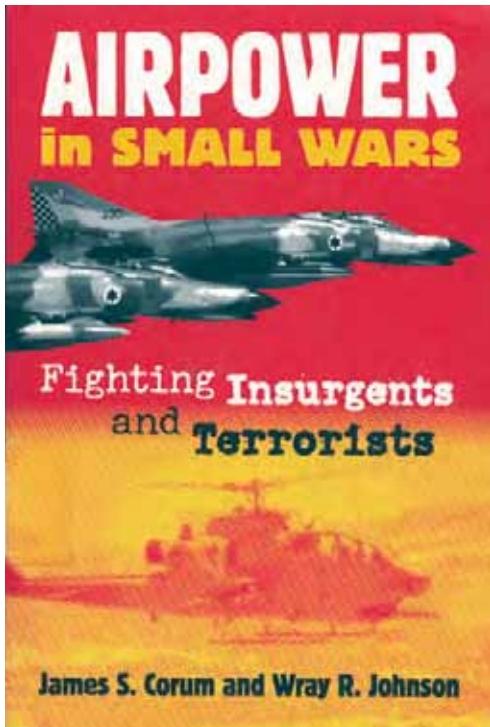
This was both an education and a fun read. It is also well referenced. I ended up buying a hardback copy, for \$1.98, on the online used book market.

Airpower in Small Wars: Fighting Insurgents and Terrorists (Modern War Studies)

James S. Corum, Wray R. Johnson

Lawrence, Kansas: University Press of Kansas. 2003. Paperback: 507 pages. ISBN 0700612408.

Review by COL Warner Farr



There is not a large nor accessible literature on airpower in insurgencies or counterinsurgencies. This book attempts to correct this shortcoming by focusing on counterinsurgency air power and gives us a promise of a future volume on insurgency airpower. An aircraft for counterinsurgency war needs to fly low and slow, detect insurgents and terrorists, and be able to dwell over the target long enough to direct firepower or deliver it. Sound like the standard U.S. Air Force aircraft you routinely see? In addition, they need to carry ordnance and be fast enough to avoid ground fire. High performance jet aircraft seem not particularly suited for the coun-

terinsurgency style war. However, helicopters, though useful, are very susceptible to ground fire and man portable surface to air missiles.

This book presents many examples of airpower in small wars and gives the background of each particular conflict to include the origins of each insurgency. Many of the examples are in Central America, early in the twentieth century, with the U.S. Marine Corps introducing the employment of aircraft against insurrections as the U.S. Army Air Corps, and the subsequent USAF, focused on strategic airpower. This has persisted to today with the Marine Corps emphasizing air support of ground units in its doctrine on combined arms operations.

The authors discuss the interaction between the United States and the countries that it assisted with aircraft, supplies, and training. The book covers the American experience in Central America, European airpower in the colonial era, the Greek Civil War, French colonial wars (Algeria and Indochina), British colonial wars (Malaya, South Arabia and Oman), the U.S. in South Vietnam, and airpower in southern Africa and Latin American counter guerrilla operations, as well as the Mideast to the year 2000. Recent U.S. operations in Afghanistan and Iraq are not covered. The examples are a framework to understand current and past air operations.

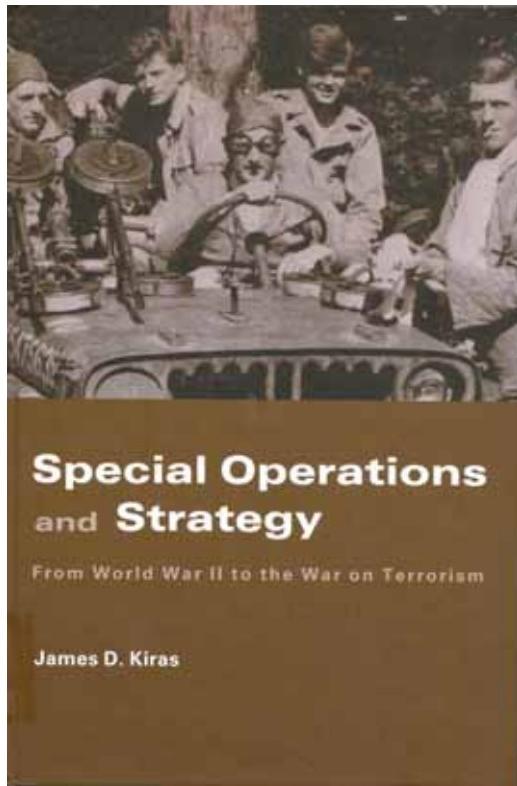
The authors point out on page four that “the often negative role played by institutional culture of the U.S. military and, more pointedly, the U.S. Air Force in terms of exploiting airpower in small wars. The Air Force is the least historically minded of all of the U.S. armed forces.” The authors, who teach in the graduate medical education system of both the Army and the Air Force, are attempting to fix this.

Special Operations and Strategy: From World War II to the War on Terrorism

James D. Kiras

Routledge Press: London. 2006. Hardcover: 230 pages. ISBN: 0415702127

Review by COL Warner Farr



The author gives an in-depth examination of the nature and theory of Special Operations in his well-researched and very well-referenced work. This is a book only for the serious readers, thinkers, and mavens of doctrine. He gives the first comprehensive theory of Special Operations Forces and evaluates the strategic significance of SOF operations with case studies.

Historically, Special Forces have been misused and how special operations should achieve a strategic ef-

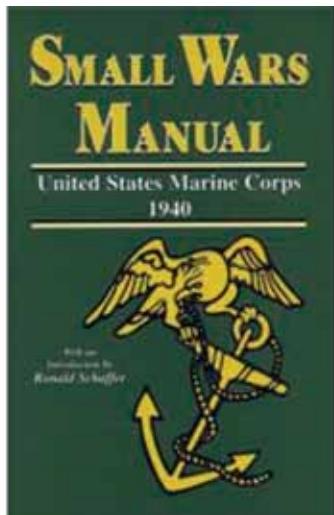
fect is not well understood. Conventional thinkers tend to think in the framework of “the independently decisive great raid.” This book discusses different special operations. It shows how in conjunction with more conventional military actions, SOF can achieve and sustain strategic effects over time. The author’s agenda is to show that an effective special operation requires a doctrinal relationship between “moral and material attrition at the strategic level through an examination of strategic theory and case studies.” This SOF strategic performance through the concept of strategic attrition is the heart of his argument. He draws in Carl von Clausewitz, Hans Delbrück, and Mao Zedong, to show that they understood that the strategic use of SOF is at its best at the “moral dimension at the strategic level” and that this effect is much greater than the “material dimension.” Plain English: the psychological effects of having a Special Forces team in your rear area is worse than the material damage that they will cause. He focuses on a number of special operations examples against enemy moral and material vulnerabilities over time, and shows that in conjunction with conventional operations, an enemy’s will to fight can be eroded more quickly and efficiently. A counter example he uses is the use of the Special Air Service Brigade during the Normandy campaign in 1944, which incorporated special operations into a campaign of attrition, and shows that this may not succeed for reasons related to the nature of strategy even when the desired goals are clearly understood.

This book takes over where the book “Spec Ops” left off in strategic thinking. If you are bound for the joint staff, War College, or the Sergeants Major Academy, you might consider reading it for your thesis preparation.

The Small Wars Manual, United States Marine Corps, 1940

United States Government Printing Office: Washington, 1940. Restricted.

Review by COL Warner Farr



The history of the United States Marine Corps is filled with expeditions, primarily small interventions to protect American life and property in the odd corners of the world -- many in Central America. After a spate of these expeditions in the 1920s and 1930s, the Corps wanted to retain these hard-won lessons of previous operations and published this manual in 1940. This is an

encyclopedia of all aspects of “small wars” and covers everything from political relationships, logistics, and tactics, to the correct principles for loading pack mules.

It has an extensive section on the staff in small wars, from the doc to the JAG to the amusement and welfare officer. There are many great quotes. One is “the medical personnel with the force is one of the strongest elements for gaining the confidence and friendship of the native inhabitance in the theater of operations.” The manual has been widely reprinted, is available from bookstores, and can be found on the web. One site is: <http://www.au.af.mil/au/awc/awcgate/swm/index.htm>.

Anyone who thinks MARSOC does not bring along experience to the SOF table should read this manual. Two of my favorite medical quotes, which I use in my briefs, are below:

How much medicine in SOCOM?

Answer: More Than Elsewhere.

“In almost every small wars operation, the number of commissioned medical & dental officers & enlisted corpsmen will be considerably in excess of that required for a corresponding force in a major war.”

NAVMC 2890—SMALL WARS MANUAL, U.S. MARINE CORPS (1940)

Command Medic Certification Program

Our Medics Are Different

“Special care should be taken in selecting the hospital corpsmen to accompany the force. In many cases, an enlisted corpsman will be required to make the diagnosis & administer the medication normally prescribed by a medical officer.”

NAVMC 2890—SMALL WARS MANUAL
U.S. MARINE CORPS (1940)





DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

NAVMC 2890
PL55g
1 Apr 1987

FOREWORD

1. PURPOSE

To distribute a reprint of the 1940 edition of the Small Wars Manual as an aid to education and training in the historical approach of Marine Corps units conducting operations in low-intensity conflicts. In the 1930's, such conflicts were referred to as "small wars."

2. INFORMATION

a. The Small Wars Manual is one of the best books on military operations in peacekeeping and counterinsurgency operations published before World War II.

b. This Manual is published for information only and is not directive in nature. It should be read in the context of pre-World War II politics and operational methods. Its republication does not indicate endorsement by the United States Marine Corps of any statement in the book.

3. RESPONSIBILITIES

a. Commanders should ensure that this Manual is available to Marines concerned with the types of activities discussed in this Manual.

b. Additional copies of this Manual may be obtained from the Marine Corps publications stock point at Marine Corps Logistics Base, Albany, Georgia, per instructions in MCO P5600.31.

4. RESERVE APPLICABILITY

This Manual is applicable to the Marine Corps Reserve.

5. CERTIFICATION

Reviewed and approved this date.

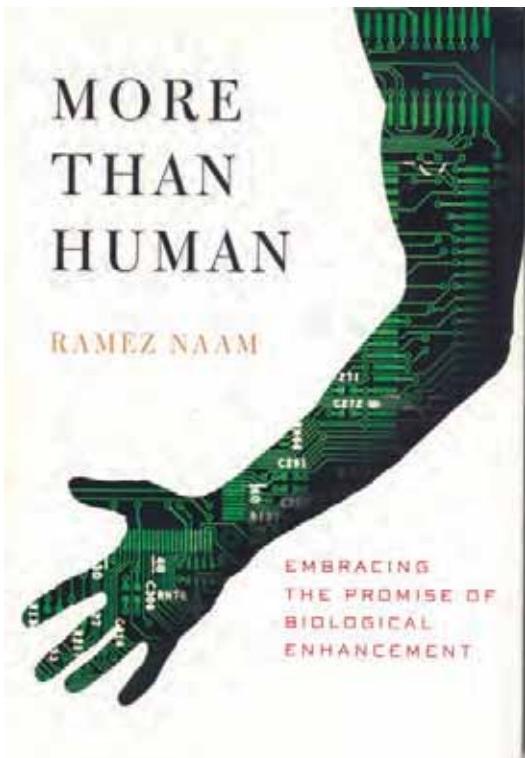
A handwritten signature in black ink, appearing to read "John Phillips".
JOHN PHILLIPS
Deputy Chief of Staff for
Plans, Policies and Operations

More Than Human

Embracing the Promise of Biological Enhancement

Ramez Naam

Review by SOCM Glenn Mercer



This review is actually the second draft after the loss of the first one to an unusually ironic circumstance. Ramez Naam is credited with being a primary developer of both Microsoft Internet Explorer and Microsoft Outlook.

In my opinion, Mr. Naam's effort could be classified as fiction based on non-fiction. Mr. Naam essentially spends some 263 pages discussing potential uses of biotechnology and human enhancement using present accomplishments and future tense of both the genetics and cyber technologies. Unfortunately, the author freely uses the terms neuro, nano, cyber, and various grammatical uses of genetics familiar among the analysts who are at the lead-

ing edge of these fields, they are not germane to the lay population. The author uses examples that originate from the fields of medicine, genetics, child development, psychiatry, and robotics. While they display the potential for exponential advancements, they are essentially confined to the "technical" reader.

From my back ground with Human Athletic Performance, I found it lacking in my area of interest. However, it is significant in regard to two other aspects that cross into this field. First, from a military perspective we are engaged in the preservation of human resources. In chapters five and six (Methuselah's World) "*I had to Google it*", Mr. Naam comes very close to defining aging as a disease process in and of itself by exploring the "what if's" of extending life span and subsequently life expectancy. This postulate is an area that potentially could mitigate the larger ethical debates that surround many of the author's examples. This work leaves the reader convinced that the technology is already available in many cases, but will always be restrained by the ethical implications of tinkering with the coding of the human form.

The second aspect is the field of robotics. Considering the significant amount of dismemberment our forces have experienced in recent wars, reading the chapters that pertain to the potentials in this field was energizing. As a reader, I would have preferred more exploration of the author's thoughts regarding the anthropological and sociological aspects of this area. He briefly explores this in chapters five and six but allocates little to it elsewhere.

In summary this book is a quick read that could have easily been double the length if it had given equal weight to affect and effect of all this promise. I would recommend this book to the experts in the field and to science personnel in general, but otherwise, it offered little that is not already available to those who habitually read the technical journals in circulation in the military, medical, and science forums today.

IO During the Malayan Emergency

James R. Bortree, Lieutenant Colonel, USAF

Previously published in *IO Sphere Spring 07*. Republished with permission.

Abstract: Lt Col Bortree analyzes the major phases of British counterinsurgency actions in Malaya, describing use of information operations (IO) core capabilities in an historical campaign context. He then contrasts British successes with the limitations of contemporary U.S. doctrine, and how lessons learned are especially relevant to current Coalition actions in Southwest Asia.

Malaya is an example of a resource-limited government that defeats a well-equipped, experienced, and organized insurgent force. The United Kingdom (UK) and its successor, the Government of Malaya (GOM), successfully countered a large-scale insurgency and achieved independence, while showing how a multifaceted civil, military and information program provided an optimum counterinsurgency response. These combined programs did not happen overnight, but were an evolution of the UK and GOM learning and adapting based upon their successes and failures. Through trial and error, UK counterinsurgency efforts evolved from an initial campaign based on retribution, into one that focused on breaking the relationship between the insurgents and the population base.

To achieve this “hearts and minds approach,” Britain’s campaign blended control, information, political, economic, and social measures under a fully unified command structure. Effective use of local civil and police forces were crucial in minimizing the cost of the Emergency, which Malaya’s own tin and rubber export revenues paid. Most significantly, this campaign effectively demonstrates how an information campaign and civil measures can achieve popular support.

INITIAL STEPS

The Malayan Communist Party (MCP) carried out anti-Japanese actions during World War II, and a protracted fight for Malayan independence beginning in 1948. Initial British evaluations of what they faced were both accurate and wrong. The British correctly assessed that the key industrial targets were the tin mines and rubber plantations of



Malaya, circa 1952. (MOD Australia)

Malaya. At the same time, they correctly identified the unassimilated Chinese civilian population as the base from which the insurgents hoped to draw support. They realized that, in addition to recruits, the critical link would be the food and supplies that friendly Chinese (the Min Yuen) would supply to the insurgents. Initial estimates of the size of the insurgent force ranged from Britain’s estimate of 2,000, up to 10,000 according to the Soviet Union — both of which were wrong. Post insurgency interviews and records found the actual number to be in excess of 12,000. This was coupled with an initial British effort characterized by Lt Gen Sir Harold Briggs — a major figure in the Emergency — as “inadequate,

under manned and under managed,” partly due to a lack of trained Chinese linguists. Further, the UK’s decision to completely change their civil and military administration hurt the Malayan people’s faith in government. MCP propaganda portrayed the change in administration as an indication of the insurgent’s success, and the loss of faith in the British Administration hampered early calls to the Chinese community for support. Worse, the scale of violence increased while the British administration studied the problem. The most conclusive item resulting from this analysis was British realization that to win, Malaya had to become independent.

ELECTRONIC WARFARE & MILITARY DECEPTION

Hoping to take advantage of technology, initial British attempts to locate and gather information on insurgent operations relied heavily upon communications intelligence (COMINT). However, enforcement of strict import controls on radios limited the MCP’s radio capability, and

they mostly relied on couriers as their primary means of communication. Because of these two actions, two-way radios were limited to MCP elite, with no radios at the platoon and company level. Some receivers were available for listening to Radio Peking, but this lack of two-way radios was to limit the overall COMINT value.

Military deception and propaganda were also limited, as administrators saw MILDEC and propaganda as possibly compromising the theme of an open and honest administration. The British and the MCP were fighting over the Malayan population and UK leaders reasoned that a strategic deception could have serious consequences on British credibility. Consequently, the Malayan Emergency did not see the use of strategic deception.

PSYCHOLOGICAL OPERATIONS & PUBLIC AFFAIRS

British High Commissioner Sir Henry Gurney, increased the emphasis on PSYOP, just as the PSYWAR division became operational in September of 1948. The original configuration of the PSYWAR Department was primarily military, with most of the personnel's experience gained during World War II. Malaya was a fundamentally different type of confrontation.

Relying on past experience, the PSYWAR division approached the Malayan Emergency from a rather traditional perspective, and guidance from the High Commissioner further diluted the effectiveness of PSYWAR. Responding to criticism from the commercial planters, following the killing of three planters by the insurgents, the primary PSYOP theme became revenge. This resulted in a campaign which threatened not only the insurgents, but the local populace who helped them, even if such help was against the locals' will.

During this period, the new newspaper sponsored by the PSYWAR division attempted to win over the population supporting the insurgents through several means. Named *Sin Lu Pao (New Path News)*, the new PSYOP sponsored paper reflected several collisions between policy, PSYOP, and Public Affairs. For example, the *New Path News*, while mocking the MCP, simultaneously reported several policy decisions that caused more damage than good. Directives allowed the High Commissioner to deport anyone who was not a federal citizen or born in Malaya, which turned out to be the majority of the Chinese squatter population. Other regulations gave the High Commissioner the right to detain anyone suspected of collaborating with the insurgents, confine them without trial, and relocate or banish families to mainland China. The regulations had an inherent flaw in that they did not discriminate between those who willingly helped, and those forced to aid the insurgents. The combination of rapid implementation and lack of discrimination of these new regulations quickly created distrust and suspicion.

CIVIL MILITARY OPERATIONS

After the initial outbreak of hostilities, one of the first items identified by both the military and the police was inadequate knowledge of the civilian population they were attempting to influence and defend. Significant changes in the population demographics, location, and infrastructure occurred during the Japanese occupation. Simply put, the British government was missing key information about the Malayan population, its makeup, and location that the registration process could provide. The key points included:

- Accurate numbers of the population and their ethnicity.
- Location and distribution of the population.
- Location of Chinese squatters and contested land.
- Food and water sources surveyed.
- Update infrastructure knowledge. What services (electricity, water, medical, schools, etc.) were available, where, and to whom?

As this process began, the MCP realized that registration would ease identification of insurgents. It would also create two additional negative effects for the insurgency. This was the first time many people had ever seen government representatives. Registration became the first step in establishing a government presence and started to dispel the perception of a distant and uncaring administration. Second, the registration served an intelligence function by determining population, food, and resource distribution throughout Malaya while also facilitating the creating or updating of administration maps.

Registration was the first step in re-establishing British presence in many remote parts of Malaya. While not permanent, the registration teams were the first government presence that many of the rural Malay villages had ever seen.

The British determined the MCP was dependent upon the Min Yuen (Chinese squatters) for logistics and resupply. Information gathered during the registration process indicated that if the plan did not include transferring deeded land to the former squatters, the probability of success would be virtually zero. Second, the registration process drove home to the British administration the fact that most of the Chinese squatters were illegally occupying their land. Third, it would reestablish British control over the outlying areas and undermine the unofficial MCP government. Finally, successful relocation would allow the British administration to sever the insurgents and their supply lines. Two unforeseen effects of the registration were valuable insight into the popular points of the MCP platform and a better understanding of the area of operations and its geographic constraints.

THE BRIGGS PLAN

The appointment of Sir Harold Briggs marked the beginning of a significant change in the way that Britain prosecuted the Malayan Emergency. Briggs was the first

person to fill the new Director of Operations role. His new position made him responsible for coordinating civil, police, military, naval, and air forces. For the first time, these capabilities were under the control of a single person. Any service questioning a Briggs' decision could appeal to the High Commissioner. Upon unifying the military and civilian police under his authority, Briggs next remodeled the War Executive Committees. Their authority flowed from federal to state to district, and finally the settlement level. Policy review occurred at a local level, and results then flowed from the settlement back to the federal. These committees met weekly and melded civil, police, and military actions into a cohesive whole across horizontal governmental levels, while coordinating national policy vertically from the federal down to the settlement level. Another critical aspect is that each committee had discretionary powers limited to its level. For example, a district committee could review and release a leaflet, if within federally determined parameters, across the district. The Committee structure allowed tailoring of national policy, actions, and messages for delivery across state, district, and settlement lines. This resulted in messages aimed at groups, ethnicities, and small settlements so that individuals could easily discern their place and role in the overall policy.

MILDEC and OPSEC

Early experiments had shown that using paratroops allowed a high degree of mobility, but that the insurgents were now watching the few clearings in the jungle where the paratroops could land. Thus, the insurgents were still able to get advance warning of paratroop arrival into their particular region of the jungle. MILDEC changed this in 1950. First, the British SAS developed a unique tree jumping harness that allowed paratroopers to insert through the jungle canopy. This usage permitted the paratroops to remain suspended in the canopy until after dark, when they would lower themselves to the ground. During the initial phase of this operation, parachute insertion using the special harness, and normal parachute missions into clearings, started to produce results. After designing a preliminary deception campaign, the *New Path News* published that the typical patrol lasted roughly two weeks. In reality, the patrols lasted a minimum of 100 days. In some cases, to support the two-week perception, some paratroops would link up with the patrols and the same number of troops that began the patrol would return within two weeks. To aid this perception, the paratroops used the same uniforms worn by the regular soldiers. In the meantime, the remaining personnel from the patrol and paratroops would continue deeper into the jungle to complete the 100 day mission. This deception resulted in the MCP consistently underestimating the number of patrols actively operating in the jungle at any one time.



British Army firebase in Malaya, circa 1956. (MOD UK)

PSYOP and PA

In 1950, Director of Emergency Information Hugh Carleton-Greene received permission to institute a radical new information campaign. He concluded the current policies offered little incentive to the Chinese squatters to defect or collaborate and, conversely, served as an incentive for the insurgents to fight to the death. Instead, Carleton-Greene proposed rewards for surrender policy, offering the first substantive shift in Malayan PSYWAR policy from the previous revenge theme. Briggs overrode police objections after Malay leaders convinced him of the potential of the surrender program's rewards.

To take advantage of this change in policy and to make the marriage of PSYWAR and PA more effective, Carleton-Greene changed the objectives of the PSYWAR section. Working closely with local political leaders and captured insurgents, they developed a new set of objectives to replace the previous revenge theme. New objectives included:

- Create distrust and suspicion between leaders and led by stressing gulf between the advantages and benefits enjoyed by MCP elite.
- Create doubt in ultimate victory by quoting from captured documents in which senior party members expressed uncertainty.
- Counter propaganda that those who surrendered would be ill-treated or killed when their usefulness ended.
- Promote dissension within units by stressing differences of treatment accorded to various ethnic, religious, or racial classes.

To further open communications with rebels and the Chinese squatters, Carleton-Greene increased the number of channels available for distributing information, adding ground loudspeakers, plays, and personal appearances by surrendered enemy personnel (SEP). However, surrendered personnel indicated that the leaflet remained the best means to communicate with rebels. In fact, the MCP declared that possession of a British leaflet (by an

MCP member) as reasonable justification for execution.

Carleton-Greene also introduced a full broadcast schedule in Malay, Tamil, and four dialects of Chinese, replacing the English and Malay only broadcasts. The new programming combined the vernacular press and translated broadcasts to become the principal means of communicating with the uncommitted people of the country. Working closely with Carleton-Greene, the PSYWAR and Emergency Information Services, Radio Malaya focused upon explaining three specific themes: the importance of registration; how the resettlement would occur; and countering the growing Malay perception that the Chinese were shown favoritism in infrastructure construction. PA worked with civil military operations and PSYWAR to ensure that the following five objectives in policy and actions matched. This ensured synchronization of message, policy, and actions across the settlement, district, state, and federal levels of Malaya.

CMO

Upon reviewing registration and resettlement data, Briggs laid out a sweeping plan for food and drug control, aimed at breaking the logistic links between the jungle-based insurgents and their Min Yuen support. The key to making the food and drug denial work was the resettlement plan begun in 1948. To ensure the success of the program, High Commissioner Sir Henry Gurney received approval to give state and settlement authorities the power to declare areas as controlled areas. The main purpose was to concentrate the population, in part, to provide a means of protecting the population from the insurgents while simultaneously cutting communications and support to the insurgents. To entice the Chinese to relocate to the new villages, villagers received a stipend while they waited for their first crop, one sixth of an acre for a home, and a minimum amount of deeded land for planting. By combining land ownership and security with access to medical facilities, water, electricity, and schooling in each village, the CMO effectively removed several key MCP justifications.

TURNING THE TIDE

In early February 1952, Lt Gen Gerald Templar replaced Briggs. After reviewing the situation in Malaya and talking with Briggs, Templar concluded, much as Briggs did, that this was primarily a political campaign. In September 1952, he created a new policy that offered citizenship to over half the ethnic Indians and Chinese. Templar then followed this success with new legislation proposing an electoral process for state legislative councils elected from the newly established village councils. Though his actions did not effectively change Briggs' plan, one of Templar's major innovations was to create a single director of intelligence who oversaw the civilian, military, and police intelligence functions. What made this new position unique was that the Di-

rector of Intelligence was primarily responsible for analysis and had little to do with actual collection. This division of responsibility let the collectors focus on collection, with all questions and requests for analysis routed to the new Director of Intelligence. The analysts were now responsible for analyzing data and producing estimates. This let the military and police focus on gathering intelligence versus answering questions from on high.

EW and MILDEC

During 1953, the MCP introduced a new type of radio for communications amongst senior MCP officials. However, the new radio allowed a much more accurate triangulation than was possible before. In fact, the triangulation was accurate enough that it could successfully guide RAF heavy bombers. To prevent civilian casualties, the Special Police would verify that the MCP camp was not holding captive civilians and would smuggle homing beacons into the camps.

The British took this new EW technique one-step further. They activated a MILDEC plan focused on the MCP leadership. The objective was to convince the MCP leadership that the British were getting their information from high-level members of the MCP. Through information obtained from surrendered enemy personnel, the British leaked that certain high-ranking members of the MCP had left the camps just prior to the RAF strikes. In the end, the MCP did not figure out the EW methodology being used and instead executed 11 mid level officials for leaking information to the British.

PSYOP

PSYOP began to emphasize the decline of the MCP with government films featuring a combination of well-known surrendered insurgents and those from the local area of the village. Another PSYOP program rotated the better-known insurgents through the contested areas to prove to the people that they were alive and well, in keeping with the government promise. Subtle points to the photos and visits included clothing, obvious weight gain, the simple fact they were alive, and doing well under the British.

The PSYOP campaign was also working on the MCP, and as mentioned above, the combination of air strikes and MILDEC allowed for the creation of further dissension within the MCP ranks. At the same time, the PSYOP section began to capitalize further upon the rewards-for-surrender program.

Another refinement was in the primary PSYOP message themes:

- a. Where did the money go?
- b. Why work against the interests of the masses?
- c. It is dangerous to carry a pistol or a carbine.
- d. One of your comrades has been killed in this area.
- e. Do you need medical assistance?"

Theme "d" was quite interesting in that, not only would the PSYOP section announce who had been killed by

the government during operations, but would also include who had been executed for possessing, reading, or doing something the MCP found offensive. As these were standardized procedures — as Briggs envisioned them — the tailored leaflets differed across districts. This particular theme was the single most effective leaflet in the message inventory, designed to induce the surrender of individual insurgents.

CMO

In a refinement of the Briggs plan on food denial, Templar decided that the security forces should focus their efforts on the guerilla supply parties operating near the jungle fringe to force the insurgents to commit resources to defending their supply organizations. A secondary effect was to force the MCP to divert additional resources to producing the necessary food. Che The, the MCP senior official countered with an aphorism “the guerillas moves among the people like a fish swims through the ocean.” Templar pointed out that food denial and civil programs “would create shallows where the fish could be found easily.”

The next phase was the creation of white areas and black areas. By 1953, in some areas designated as white areas, insurgent activity had practically ceased: residents were not subject to emergency restrictions or regulations. In comparison, black areas continued to enforce all the regulations and restrictions. In fact, the definition of what constituted a white area closely agrees with what Mao would define as a base area. The establishment of white areas delivered yet another blow to the insurgent campaign, which had yet to establish a secure base area. Contrast this insurgent failure with the government which actively advertised its success in doing exactly what the insurgents had been attempting to do for the last four years.

PA

Public affairs (PA) had a challenging role of keeping the population informed of what was going on and why the selected measures were necessary. The food denial programs and the resultant restrictions programs provided a legitimate means for villagers to refuse food to the insurgents. PA also disseminated the village requirements for designation as a white area to the local populace.

Continuing distribution of radios and openness shown by the British government created two developments that PA had to counter. The first created a new tactic for the MCP. In mid-1952, the MCP shifted their tactics from the adults in the villages to the Chinese students in the middle schools. The ramifications of this shift in policy did not become apparent until 1954 when the students began to attack pro-government educators. The second development was the government plan to begin educating the populace that a unified government which represented all, was better than one based upon a single dominant ethnicity. Templar forced alliances between the various Malay factions to further the single unified government. At the same

time, debate and discussions featuring panels of respected local academics debated the issues using the radio as a means for the entire nation to participate.

MOPPING UP (1954 - 1960)

In 1954, General Sir Geoffrey Bourne replaced Templar and remained the senior British official until Malaya became independent on 31 August 1957. The final military push from the MCP came on an unexpected front, in the schools of Malaya. The execution of several senior administrators of Chinese high schools in 1954 alerted the British administration to the new MCP front. During 1954-1956, the British administration discovered several large MCP cells in different, large, mostly Chinese high schools across Malaya. To counter this, Bourne and his Malayan successors, used a variety of programs to combat the MCP incursion into the high schools.

PSYOP

The concept of a peace offensive, developed by Templar’s administration, became the new overall theme behind the PSYOP program. As insurgent numbers decreased, the focus shifted from groups to individuals. Group photos further emphasized the surrendered insurgents peaceful co-existence with the government, years after laying down their arms.

For the insurgents who did not cooperate, the government resorted to other means. First, forces would surround an insurgent area. Then, the government offered insurgents the opportunity to surrender. Message delivery was through assorted means such as radio, voice, speaker aircraft, leaflet, and contact with villagers. The troops would then withdraw for a period of three days. At the end of three days, the troops moved back into the area and killed all remaining insurgents. If captured, insurgents went to prison on extended sentences.

CMO

By 1954, the relocation program approached completion. Over thirty percent of the villages provided their own protection. In some areas, village guards were down to standby status as the size of white areas increased. The increase in white areas allowed Bourne to begin another step, which was the establishment of a common educational system across Malaya. Bourne created school management committees using locally elected parents and school administrators to enforce common standards. This was the final unifying step taken by the British for the sole purpose of breaking down ethnic barriers.

LESSONS FROM MALAYA

Briggs recognized the insurgency he was facing in Malaya differed significantly from World War II, though both this and the Malayan Emergency centered on clashing belief systems. However, the means to success were diametrically opposite. In the case of WWII, defeating the axis

governments resulted in the defeat of the nation. This is markedly different from the Malayan Emergency where two parties were fighting to become the Malayan population's choice for governance. This conceptual difference was the underlying reason for Briggs' earlier comment that the Malayan Emergency was primarily a political campaign.

MESSAGE

Malaya demonstrated the ability of a ruling government to deliver a coherent message, seamlessly coordinated through words and policy, is critical to a successful counterinsurgency. The message that the British delivered to the Malayan populace was simply, "the government is your friend." This ability to connect with the Malayan people was the result of vertical and horizontal coordination across the Malayan government structures. The ability to meld civil, military, and police policies and actions transmitted a message heard loud and clear by the Malayan population. The MCPs inability to offer a better or at least equal message resulted in their eventual downfall.

PA

PA was a key message channel during the Malayan Emergency. PA's role was critical and evolved as the conflict progressed. In the initial phase, it explained government reasoning behind the registration and relocation of the populace. PA was able to explain why both government programs were beneficial to the local population. Later, in conjunction with Radio Malaya, PA conveyed accurate news about important local issues to the Malayan population. In that regard, providing access to news and a simple radio served as a means of driving another wedge between the insurgents and their supporting population base. Carleton-Greene let the radios receive Radio Malaya and Radio Peking. This deliberate action allowed the population to listen to both sides of the argument and make an educated choice about which side to support.

DECENTRALIZED PLANNING

One of the primary lessons of the Malayan Emergency was the value of decentralized planning. One of the problems the British administrations faced was synchronizing the message across nine states which had populations composed of Chinese, Malay, and Indian, along with a religious mix of Christianity, Buddhism, and Islam. Timeliness and relevance were important considerations as well. The ability to tailor a message for a region down to a settlement level was critical in the overall success. Early in the conflict, Hugh Carleton-Greene realized that centralizing this process would create unacceptable delays, negating any advantage that PSYOP could create. Fortunately, Lt Gen Briggs recognized this same issue. This was one reason for the creation of the district warfare executive and settlement warfare executive committees for coordinating government policies and actions vertically (from federal down to settlement) and horizontally (across police, civil, and military). Working closely together, Briggs and Carleton-Greene created guide-

lines that allowed the lower levels to create and distribute PSYOP leaflets faster than the MCP. By the end of the conflict, insurgents discovered the government had better knowledge of their losses than their own leadership.

Such decentralized planning was key in being able to focus PSYWAR efforts on individuals versus a movement. In the end, this decentralization allowed the government to react faster than the MCP, creating the perception of a force that would eventually win out over the insurgents.

JOINT IO DOCTRINE VIEWED THROUGH MALAYA

EXPERIENCE

Generally, doctrine is the synthetic product of actual experience in previous conflicts. When reviewing the majority of Joint Doctrine, it became clear the services self-concepts determine not only how they prepare for war, but how flexible they will be in responding to unexpected situations. The majority of Joint Doctrine is based on large-scale conflict, and thus the United States Armed Forces are organized on the same basis. This can be seen in the types and variety of documents that relate directly to large-scale conflict, including: fire support, forcible entry, space, air mobility, laser designation, amphibious assault, amphibious embarkation, and suppression of enemy air defenses. Yet only two newer documents, *Foreign Internal Defense* (JP 3-07.1 in 2004) and *Urban Operations* (JP 3-06 in 2002), relate directly to insurgency.

INSURGENCY

Insurgency as we know it today is neither a new phenomenon nor a recent one. Once classified as rebellions or revolutions, insurgencies have long existed in the past. During the twentieth century, the United States has been involved in multiple counterinsurgency efforts. The Hukbalahap rebellion in the Philippines, Vietnam, Afghanistan, and Iraq show recent U.S. counterinsurgency involvement. Based on lessons from the Malayan Emergency, the British treat insurgency as a different form of war. Counterinsurgency techniques and methodology are fundamentally different from conventional conflict. Based simply upon frequent U.S. involvement, one could expect that U.S. doctrine would address counterinsurgency. In reviewing the joint publications, insurgency and counterinsurgency are both mentioned, primarily in our *Doctrine for Joint Operations* (JP 3.0), *Military Operations Other Than War* (JP 3-07) and *Procedures for Foreign Internal Defense* (JP 3-07.1). Of all the joint doctrine for operations, the one for foreign internal defense mentions "insurgency" 82 times. If all the insurgency references in the doctrine documents examined by this article are combined, the three JP's (JP 3.0, 3-07 and 3-07.1) count for 82.6% of the references. This means that for the remaining nine documents, "insurgency" is mentioned roughly once every 90 pages (23 refs over 1998 pages). Granted this is not critical if the term is relevant in context.

The Malayan Emergency demonstrated the importance of a tightly integrated and clearly defined IO campaign within a counterinsurgency. However, the current IO doctrine creates the opposite effect, particularly in how IO is organized. There are currently three doctrinal templates in existence for the services to use.

The first and oldest is JP 3-13.1 *Command and Control Warfare*, and the second edition of JP 3-13 *Joint Doctrine for Information Operations*, which finally became official on 13 February 2006, after a protracted review process.

The IO documents are particularly relevant in terms of their role within counterinsurgency. As a key means of influencing a target population, these documents as a group do not distinguish between major conflict and insurgency. In some cases, their guidance is simply wrong. For example, Figure 4 is common to JP 3.0 *Doctrine for Joint Operations*, JP 3-13.1 *Command and Control Warfare*, and JP 3-57 *Civil Military Operations*. What is interesting is that Figure 3 lists counterinsurgency as a non-combat mission. Current losses of U.S. troops in Iraq highlight the falsity of this perception.

Using the Iraq example, JP 3-0 later states the U.S. military does not usually engage in counterinsurgency. This assertion flies in direct contrast to the U.S. military's experience in Vietnam, and the ongoing situations in Iraq and Afghanistan. All three primary publications specify the military will support insurgencies or support counterinsurgency as directed by our government. In that regard, some of the newer documents such as JP 3-58 and JP 3-07.1 are starting to show improvement.

IO and insurgency doctrine documents as a whole suffer from two problems. First, there is no service lead established for the insurgency mission, which means that there is no advocate to fight for funding and resources to support this area. Notably, we have a service lead for specialized operations such as embarking troops for an amphibious assault, yet counterinsurgency is lumped with unconventional warfare under Army. Second, lack of guidance lets the services determine internal resources for this mission. For example, the Marine Corps formalized counterinsurgency in MCWP 33.5. Third, the Army has not clearly established its role as the lead service — though they are drafting new counterinsurgency guidance — while the Air Force and the Navy currently have no counterinsurgency doctrine at all.

However, considering the frequency of U.S. involvement in insurgency or counterinsurgency, it makes sense, that someone should be in charge of coordinating COIN resources. One service should be in charge and define the other services' supporting responsibilities.



Fighting the MCP.
(MOD UK)

MESSAGE

The most important lesson from the Emergency remains relevant today: the importance of being "propaganda minded." All personnel involved in the campaign, from government officials, police, to soldiers — especially at the grassroots level — must provide the same message: "the government is your friend." The U.S. ability to transmit a similar message is critical. The prerequisites to do this do not exist in U.S. doctrine for three reasons: artificial constraints, local involvement, and decentralized planning.

The British concept of PSYWAR was markedly different from the U.S. version of PSYOP. The UK brought in a military deception specialist named Hugh Carleton-Greene. Shortly after his arrival, he assumed overall command of the British PSYWAR operation for PSYOP and PA. Carleton-Greene effectively became the coordinator for all messages developed and disseminated through PA and PSYOP methodologies, which allowed the British to create and disseminate a cohesive message in a timely manner.

U.S. doctrine states PA and PSYOP will coordinate to make sure those messages will not conflict. The artificial constraints begin with JP 3-61, stating PA personnel will not be involved in PSYOP activities, and PSYOP personnel cannot talk to media unless it concerns a PSYOP program. In Malaya, PSYOP messages were disseminated using radio, newspapers, and leaflets. However, U.S. doctrine prohibits contact with traditional media (newspaper, radio, etc.) by PSYOP personnel. Notably, in 1952 Hugh Carleton-Greene published an article in the New York Times, titled "In Malaya the Front is Everywhere." The article identified Carleton-Greene as former head of Information Services, when at the time of the article he was Chief, PSYWAR Division. If Malaya had been a U.S. operation and Carleton-Greene a U.S. citizen, he would not have had access to any press.

Another artificial constraint is the decision process that removes authority for PSYOP and concentrates it in Washington DC, further complicating the situation. A second key point is that British media access focuses upon supporting the commander; yet JP 3-53 specifically states that the primary purpose is to "expedite the flow of accurate and timely information about the activities of U.S. joint forces to the public and internal audience." Unfortunately, these distinctions place an artificial constraint upon U.S. operations in developing and disseminating a synchronized message. An example of this was the uproar in 2006 after the U.S. placed positive news articles in the Iraqi press. American media claimed this was an example of the U.S. compromising free press in Iraq. The involvement of local personnel was critical in the eventual success of the Malayan Emergency. Local involvement ranged from designing programs and leaflets to garnering political support for the embattled administration. This is particularly problematic in terms of

PSYOP, which relies upon U.S. planners designing and creating appropriate messages. Unlike the British, U.S. methodologies are somewhat more limited. Recent articles in the Washington Post, NY Times and on CNN reported on the Department of Defense's unwillingness to use local personnel due to security clearance issues. This is in direct contradiction to the methodologies employed by the British in Malaya.

DECENTRALIZED PLANNING

The key British decisions to create a single position for all government coordination, and to decentralize, contrast with current U.S. policy, basic organization, and the PSYOP coordination process.

To begin with, American policy does not adequately capture the lesson of a single person responsible for civil and military integration. Today, a State Department official can be responsible for civil and military matters. However, when a Joint Force Commander (JFC) is responsible, this same relationship does not exist. Joint Pub 3-08, which rightly advocates the use of different executive branches in the performance of the job also states the military must build consensus, and that the goals of an institution may conflict with the private, usually short term, agendas of its members. It then goes on to state that the key to success in interagency cooperation is to achieve consensus in the Department of Defense before entering the interagency process. Again, the Malayan Emergency was managed from within theater. The U.S. process does not reflect this lesson.

In essence, American policy creates unnecessary time delays by having another staff build consensus outside the theater of operations, without a senior decision maker. The problem in most group dynamics is that decisions can be over analyzed or diluted. Theoretically, the theater experts are not located in Washington DC — home of the interagency process — but rather in theater. This does not discount some experts that work in various agencies, but the majority of such experts with contemporary knowledge reside in-theater.

The second major problem is that of organization. The British were able to combine all civil and military functions under a single senior administrator. The U.S. does not possess a similar ability as the actual problem is external to the DOD. This highlights a major lesson from Malaya not incorporated into our current doctrine: military and civilian departments maintain separate chains of command that do not merge until they reach the U.S. President. Briggs' reorganization was a means to alleviate this specific problem. Unfortunately, this problem is larger than the U.S. military,

so in the meantime this design compromises the ability to push decisions down to theater level. Briggs was able to decentralize planning, and American policy does not capture the first step in that process, that of a single decision maker in theater.

The final example concerns the development of PSYOP themes and messages. By 1952, four years into the emergency, PSYWAR officers at the district and settlement level had five themes available for execution. So long as the settlement PSYWAR officers stayed within the approved PSYWAR template, federal approval was not required prior to production and dissemination. This framework also directs rapid implementation of messages and themes at the highest (federal and state) levels without interfering with the local campaign.

This contrasts with U.S. IO doctrine Joint Pub 3-07.1 has a section which calls for working with the local authorities and representatives, but does not provide the same degree of leeway that the British used to achieve success in Malaya. While the document actually mentions "local" sixty-two times, it still requires most actions to be coordinated for approval through the senior staff and provides very little guidance for simplifying the chain of command. The result is that while the document recommends tailoring the mission to meet local needs, central management of all coordination is mandatory.

Unfortunately, the DOD places even tighter controls on the development of PSYOP messages than it does on kinetic capabilities in theater. In fact, JP 3-53 specifically states, "The Secretary of

Defense normally delegates PSYOP product approval to the supported combatant commander. This does not mean that the supported combatant commander also has been delegated approval for PSYOP product dissemination."

This is an important distinction, which means that Joint Force Commander cannot distribute leaflets in his/her theater of operations. In fact, based on this doctrine, the highly successful British campaign would never have worked, as only the Joint Force Commander can approve products (when delegated). However, the joint force commander cannot approve themes, objectives, or dissemination of the product in his own theater. This becomes particularly troublesome as the ability to decide what will work in theater becomes resident not with the staff working in theater, but rather in the Secretary of Defense's staff in Washington, DC. Contrasting this with process applied in Malaya, theater staff made all PSYOP decisions with downward delegation to locales for material production and dissemination. The American policy of centralizing guidance also increases the time necessary to create, produce, and disseminate a PSYOP message. This is in direct contrast to principle six of the PSYOP methodology, which states that timeliness is critical.



Airborne PSYOP in Malaya.
(PSYWAR.org)

Technology

One of the key lessons of the Malayan Emergency was that technology advantages were almost superfluous. In almost every category, the British and government of Malaya had technological superiority over the insurgents. In fact, the MCP's dependence upon a courier system rendered Britain's sophisticated COMINT technology irrelevant. At the same time, the jungle limited access to both aircraft and vehicles. Used for strategic, operational, and tactical mobility, aircraft and motor vehicles could not achieve their designed impact. Instead, Britain relied on patrols, which essentially negated advanced technologies in a leveling effect between the insurgents and British forces. Technology cannot counter informal social networks. Unfortunately, as John Nagl points out, a "basic tenet of American military doctrine is the concept of massive firepower/technology."

Placed in context, Malayan lessons would indicate a connection between the lack of British success in using advanced technology and insurgency. Current lessons from Iraq and Afghanistan are showing that insurgents are able to adapt commercially available technology to their needs. In Iraq today, computers, key chains, garage door openers and cell phones represent several examples of non-traditional technologies being adapted for insurgent uses. Yet there is no JP that provides any direction on how to counter the integration of technology in a counterinsurgency. Worse, the basic lesson that American technology might be ineffective is lost.

RECOMMENDATIONS

First, our doctrine must recognize insurgency as a combat operation. The problem with insurgency is that our current doctrine ignores the lessons learned from Malaya and now Iraq. Our new doctrine should not be part of the JP 3-07 series on major operations other than war. Rather, it should be a stand-alone document that designates a single service as the lead for the counterinsurgency mission. The U.S. Air Force and Navy have a role, but are not appropriate for developing counterinsurgency doctrine. The Army, according to John Nagl, has systematically dismissed insurgency when not engaged in an active insurgent conflict. As the United States Marine Corps has shown interest in counterinsurgency, one recommendation would be to designate the USMC as the lead service in the counterinsurgency mission. This would include making the USMC the service lead for organizing and equipping forces for insurrections. (*Editor's Note: Army Field Manual/Fleet MarineForceManual3-42, Counterinsurgency, Incorporating a considerable number of lessons learned from Malaya, was finally published on 15 Dec 2006.*)

This message problem is partially within the scope of DOD doctrine to change. Current U.S. law prohibits the use of PSYOP messages upon the American populace. However, the concept of using traditional media to convey either PSYOP or deception messages would create a fire storm within the U.S. media community. The World War II D-Day

methodology used the media as unwitting participants, in that they reported what they were given. The issue centers around whether PA will pass misleading information to the media. Unfortunately, JP 3-61 seems to imply that some type of agreement needs to be in place with civilian media before removing any artificial constraints. This becomes important as modern communications technology continues reduce the traditional difference between theater and domestic audiences. Without resolution to the question of access to foreign media for counterinsurgency messages, U.S. PSYOP will remain effectively shackled, and incapable of creating British-styled successes.

In terms of decentralized planning, and specifically in terms of PSYOP, this paper recommends that the theater commander have the ability both to develop themes in advance, for approval, and to disseminate these themes through the appropriate mediums in theater. This authority would also include the ability to push pre-approved themes and products to lower levels for faster implementation than our current models.

Similarly, the purpose of a country team, when working with the U.S. ambassador, is to provide contact with and decision-making authority in country to respond to the crisis du jour. Peace and conflict, not war, are the situations where country teams normally exist. Based upon the Malayan Emergency, the U.S. military needs that similar capabilities and authorities for counterinsurgency. However, if a country team is in place when the U.S. declares war or places a JFC in charge, those teams lose their decision authority. Decision authority reverts to Washington versus theater. Instead, this paper recommends that a country team provide the same capabilities to the Joint Force Commander or an ambassador. Appropriate policy decisions would remain in Washington, but execution should remain under the direction of either the JFC or ambassador, supported by appropriate staffs. A common country team would also simplify transition to a more peaceful situation managed by an ambassador. It would eliminate many duplicative staff actions attempting to achieve consensus on issues on the opposite sides of the world.

CONCLUSIONS

Have we incorporated those lessons learned by the British Government and the Government of Malaya during the Malayan Emergency into our doctrinal guidance? At most, the American armed forces have learned the lessons that they wanted to learn. Critical terms like insurgency and downward delegation are in the doctrine, but the organizations retain a highly centralized management style, which diametrically opposes the lessons of Malaya. Insurgency is not a distinct form of war according to U.S. doctrine, and the same doctrine shows it does not involve combat. The evening news from Iraq (or in the past, Vietnam) highlights the inad-

equacy of our current definition for insurgency.

Critical capabilities like PA and PSYOP are shackled by bureaucratic restraint and artificial limitations. In the battle of minds, the U.S. has organized to fail by limiting its ability to integrate civilian and military capabilities effectively. Organizational limitations hamper U.S. efforts in winning any conflict that sheer force of arms cannot handle. At a minimum, looking to Washington DC for every PSYOP and PA decision will so increase our decision cycle timeline as to make it completely ineffective, regardless of the decision rendered. Furthermore, the knowledge necessary for effective and efficient decisions is located in theater.

Our actions show how little experience our guidance actually captures. This should be doubly frightening given the accelerating pace of insurgencies in the world today.

REFERENCES

1. Blank, Stephen, and Air University (U.S.). Center for Aerospace Doctrine Research and Education. Responding to Low-Intensity Conflict Challenges. Maxwell Air Force Base, Ala. Washington, DC: Air University Press; For sale by the Supt. of Docs., U.S. G.P.O., 1990.
2. Breuer, William B. Hoodwinking Hitler: The Normandy Deception. Westport, Conn.: Praeger, 1993.
3. Cable, Larry E. Conflict of Myths: The Development of American Counterinsurgency Doctrine and the Vietnam War. New York: New York University Press, 1986.
4. Clausewitz, Carl von, Michael Eliot Howard, and Peter Paret. On War. Princeton, N.J.: Princeton University Press, 1984.
5. Coates, John. Suppressing Insurgency: An Analysis of the Malayan Emergency, 1948-1954, Westview Studies in Regional Security. Boulder: Westview Press, 1992.
6. Creveld, Martin Van. The Transformation of War: The Most Radical Reinterpretation of Armed Conflict since Clausewitz. New York, NY: Simon & Schuster Inc, 1991.
7. Deery, Phillip. "The Terminology of Terrorism: Malaya 1948-1952." *Journal of Southeast Asian Studies* (2003): 231-47.
8. Derry, Anthony. Emergency in Malaya: The Psychological Dimension. Latimer, UK:
9. Psychological Operations Section, Joint Warfare Wing, National Defence College, 1982.
10. Godson, Roy, and James J. Wirtz. Strategic Denial and Deception: The Twenty-First Century Challenge. New Brunswick, N.J.: Transaction Publishers, 2002.
11. Greene, Hugh Carleton. "In Malaya the Front Is Everywhere." *New York Times*, May 4, 1952 1952, SM 12.
12. Hamilton, Donald W. The Art of Insurgency: American Military Policy and the Failure of Strategy in Southeast Asia. Westport, Conn.: Praeger, 1998.
13. "Interagency Coordination During Joint Operations Vol I." edited by Department of Defense: United States Government, 9 Oct 1996.
14. Jane's Radar and Electronic Warfare Systems. Edited by M. Streetly. London: Biddle Ltd., 2002.
15. Johnson, Chalmers A. Revolutionary Change. 2nd ed. Stanford, Calif.: Stanford University Press, 1982.
16. "Joint Doctrine for Civil Affairs (JP 3-57.1)." Department of Defense, 14 April 2003.
17. "Joint Doctrine for Civil Military Operations (JP 3-57)." Department of Defense, 24 January 1997.
18. "Joint Doctrine for Electronic Warfare (JP 3-51)." edited by Department of Defense: United States Government, 7 April 2000.
19. "Joint Doctrine for Military Deception (JP 3-58)." Department of Defense, 31 May 1996.
20. "Joint Doctrine for Operations Security (JP 3-54)." In for: Department of Defense, 24 January 1997.
21. "Joint Doctrine for Psychological Operations (JP 3-53)." Department of Defense, 5 Sept 2003.
22. "Joint Doctrine for Public Affairs (JP 3-61)." edited by Department of Defense, 14 May 1997.
23. "Joint Tactics, Techniques and Procedures for Command and Control Warfare (JP 3-13.1)." Department of Defense, 7 Feb 1996.
24. "Joint Tactics, Techniques and Procedures for Foreign Internal Defense (JP 3-07.1)." Department of Defense, 30 April 2004.
25. "Joint Tactics, Techniques and Procedures for Information Operations (JP 3-13)." Department of Defense, 9 Oct 1998.
26. "Joint Tactics, Techniques and Procedures for Military Operations Other Than War (JP 3-07)." Department of Defense, 16 June 1995.
27. "Joint Warfare of the Armed Forces of the United States (JP 3-0)." Department of Defense, 14 Nov 2000.
28. Kamaruddin, Hafizah. "Learn from the Malayan Emergency Experience to Fight Terror." *Malaysia General News*, 1 June 2005 2005, 1.
29. Keegan, John. The Iraq War. 1st American ed. New York: A.A. Knopf, 2004.
30. Komer, R. W., and United States. Advanced Research Projects Agency. The Malayan Emergency in Retrospect; Organization of a Successful Counterinsurgency Effort. Santa Monica, CA.: Rand, 1972.
31. Leites, Nathan Constantine, and Charles Wolf. Rebellion and Authority; an Analytic Essay on Insurgent Conflicts. Chicago: Markham Pub. Co., 1970.
32. Lord, Carnes. "Rethinking Public Diplomacy." 2005.
33. Lowenthal, Mark M. Intelligence: From Secrets to Policy. Vol. 2. Washington, D.C.: CQ Press, 2003.
34. Mao, Zedong. Selected Military Writings of Mao Tse-Tung. 1st ed. Peking: Foreign Languages Press, 1963.
35. Nagl, John A. Learning to Eat Soup with a Knife: Counterinsurgency Lessons from Malaya and Vietnam. Paperback ed. Chicago: University of Chicago Press, 2005.
36. Rice, Edward E. Wars of the Third Kind: Conflict in Under-developed Countries. Berkeley: University of California Press, 1988.
37. Sarkesian, Sam Charles. Unconventional Conflicts in a New Security Era: Lessons from Malaya and Vietnam, Contributions in Military Studies, No. 134. Westport, Conn.: Greenwood Press, 1993.
38. Short, Anthony. The Communist Insurrection in Malaya, 1948-1960. New York: Crane, Russak, 1975.
39. "Smiling Tiger." *Time*, Dec 15, 1952 1952, 24-27.
40. Taruc, Luis. He Who Rides the Tiger; the Story of an Asian Guerrilla Leader. New York: Praeger, 1967.
41. Thayer, C.W. Guerilla. New York, NY: Harper & Rowe Publishers, 1963.
42. Thompson, L. Dirty Wars: A History of Guerrilla Warfare. Somerset, Great Britain: David & Charles Military Books, 1990.
43. Thompson, R. Guerilla: The Lessons of Malaysia and Viet-nam. New York, NY: Praeger Publishers, 1966.
44. White, Nicholas J. "Capitalism and Counter-Insurgency? Business and Government in the Malayan Emergency, 1948-57." *Cambridge Journals* 32 (1998): 149-77.

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The Doctor is In

Task Force 31 uses host-nation medical care to support its COIN efforts

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Healing Hands 3rd Special Forces Group medical professionals treat Afghan nationals at a forward firebase. The firebases, located in remote hostile areas, are used to secure the area and enable the SF teams to assess and begin community projects. *Photo courtesy Sean Keenan.*

Task Force 31, composed of the 1st Battalion, 3rd Special Forces Group, has implemented a comprehensive counterinsurgency plan during two rotations in support of Operation Enduring Freedom in Afghanistan. One prong of the plan that is often overlooked is the use of host-nation, or HN, medical care as a strategy for supporting the counterinsurgency plan in the Afghanistan Theater of Operations.

The plan, which consists of providing routine and basic preventive medical (sick-call type) HN care, is in direct contrast to the rules of eligibility in force throughout the theater. Current rules of eligibility essentially allow troops to provide only emergency care to local nationals. The rules are used by United States conventional forces and applied through medical agreements with other members of the International Security and Assistance Forces, or ISAF, the NATO organization in-country.

Task Forces 31's medical "rules of engagement" often clash with the conventional methods of approaching

medical care of Afghan nationals, and this article seeks to explain why the strategy is valid in the area of operations, or AO, of Regional Command South and Regional Command West. Of key importance to understanding the strategy is to realize that TF-31's goals are different from those of the ISAF. This article does not seek to present a global strategy for the application of health care but rather to provide an explanation of the use of medical care in the overall strategy of fighting the insurgency.

With the exception of some key cities, southern Afghanistan is a collection of underdeveloped towns. Hospitals are located only in the larger cities (Kandahar, Lashkar Ghar, Qalat, Farah, Herat), and many of those are under-staffed and under-resourced. The lines of communication throughout the region are primitive at best, with paved roads connecting only the larger towns and district centers. The anti-coalition militia, or ACM, the catch-all phrase for the insurgents, denies free passage on many of

the main roads connecting towns and provinces throughout the region. Health care provided in many of the small towns and villages consists of a small clinic or pharmacy with a “provider” who is more interested in selling medications than actually diagnosing and treating medical conditions.

Nongovernmental organizations, who in other underdeveloped countries contribute significantly to the reconstruction of medical organizations and clinics, do not venture into the area because of the volatile security situation. The overriding goal of the Afghan Ministry of Health is to have a clinic within a three-hour walking distance of every citizen; however, this isn’t always the case. The clinics are not always staffed with qualified providers, and they are not always supplied with the basic items needed to provide care, meaning that the people living in the region have little or no basic medical care.

With the lack of primary care, it seems obvious that the Afghan people living in these remote areas have no access to surgical or preventive medical care, which plays a large part in the infant mortality rate being 160.23 per 1,000 live births (the third highest in the world) and the average life expectancy being only 43.16 years.¹

COUNTERINSURGENCY STRATEGY

Task Force 31 is involved in a counterinsurgency operation aimed at bolstering the fledgling Afghan government against the force of insurgents who are seeking to destroy it. The resurgent Taliban, fighting against the newly formed Islamic Republic of Afghanistan, is the insurgent force.

In order to bolster and support the new government, Task Force 31 relies on lethal and nonlethal operations. Lethal operations are the typical use of a military force to close with and destroy the insurgent forces in order to physically separate them and their influence from the local populace. Nonlethal operations include bolstering the local governmental agencies and services, and in many cases, providing much-needed or absent services to the people in the hopes of “winning the hearts and minds” of the local populace and undermining ideological support for the insurgency, while gaining support for the legitimate Afghan government.

Special Forces teams are uniquely qualified to establish self-sustaining base camps, or firebases, in remote or hostile areas. These are established with the intent of



WRAP IT UP Trauma and wound care are daily practice in the firebase clinics. SF medics gain an unparalleled level of experience and training at these clinics. *Photo courtesy Sean Keenan.*

securing the local area but also of assessing and beginning community projects and restructuring. With embedded specialists in Civil Affairs, or CA, and Psychological Operations, or PSYOP, the teams at these bases conduct lethal and nonlethal operations. Though there are specific provincial reconstruction teams for this mission, they sometimes lack the necessary security and familiarity with some of the more hostile or remote areas.

SF MEDICINE AS A COUNTERINSURGENCY TOOL

SF medics, unlike most other special-operations medical providers, are trained specifically to operate autonomously in remote locations. Though they have a defined scope of practice, their training comprises a wide range of medical, dental, veterinary and preventive-medicine topics. They are trauma specialists, but they are also trained in the medical care of children, adults and geriatric patients. At many of our firebases, because of the solid background of training and acquired experience, many of our medics are the highest trained medical providers in the community. The mature provider, aware of both his scope of practice and his limitations, has the potential for enormous effects in these communities. The clear definitions of scope of practice of our American subspecialties of medicine are much less clear in these situations. This is not a license for medics to do whatever they think they can but a realization that any care is an improvement, and in many cases it may prove to be lifesaving, when no other care is available. This point should not be lost on the reader, and the potential for long-lasting benefit to the host-nation community is great.

Though ultimately our forces and those of ISAF seek to establish a secure and self-sustaining nation, there are major security issues in our AO. Medical care provided by the regular military assets of our NATO partners is specifically resourced to care for the sick and wounded of the coalition forces and for patients who are wounded by our forces, whether enemy combatants or civilians. Because of the limited nature of the planning and resourcing of medical assets, there is a need to limit the care provided to local nationals. As a result, the regular military medical assets have established various medical rules of eligibility, or MROE, for caring for local nationals.

In general, local-national patients cannot be cared for in coalition medical facilities except for emergency care — defined as a condition that is life, limb or eyesight threatening — and when there is bed space available at the major Level-3 facilities (as a measure of preserving the limited resources available). There is technically no leeway for individual case consideration when applying this MROE; however, area Level-1 and -2 facilities and forward surgical teams have been known to provide limited

care and surgeries on a case-by-case basis for technically nonemergent conditions. Some examples of these cases are: amputation revisions, appendectomies, skin grafting for third-degree burns and external fixation of fractures.

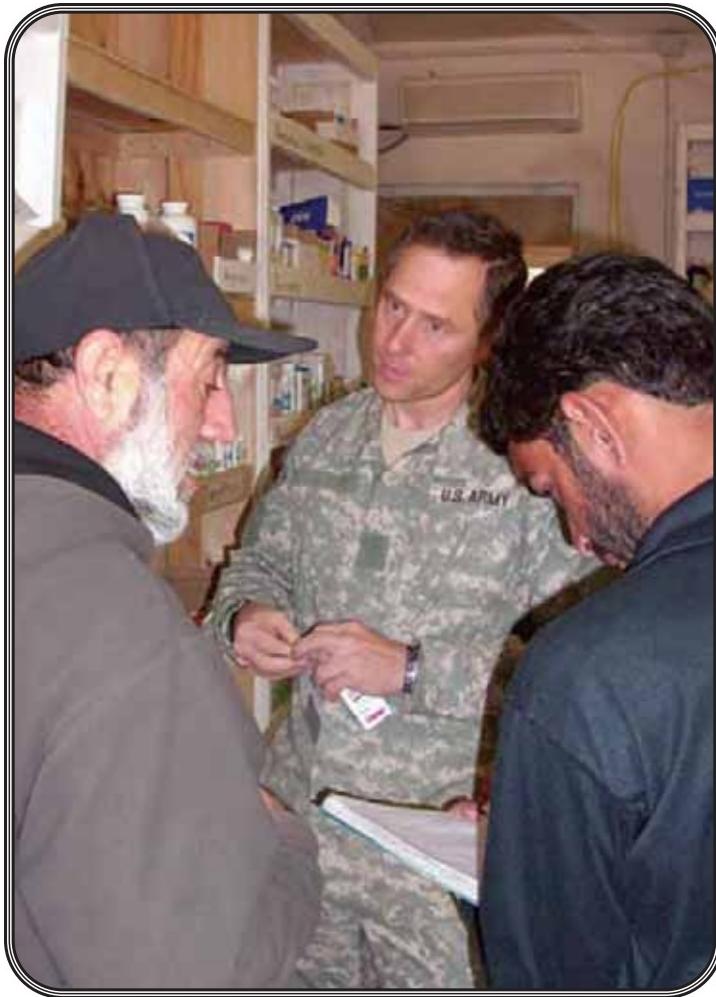
In regard to dedicated local-national care, traveling teams of medical civic-action programs, or MEDCAPs, have been developed by the larger conventional medical-support structure to provide additional benefits to host-nation personnel. The experienced provider, however, will have to participate in only a few MEDCAPs — no matter how large the package and how specialized the providers — to appreciate the relative futility of showing up in town one time and providing care. A much more effective strategy is to identify areas that are truly underserved and provide basic services there on a more regular basis, as we do at our firebase clinics.

Many times, our medical-care strategies clash with conventional MROEs because of the operational constraints placed on each medical unit. Guidance to conventional medical units specifically prohibits those units from seeing local nationals except when they present in extremis, literally dying at their front gate.

There are also some prohibitions against using medical supplies to treat locals, although there are funds available through the Commander's Emergency Relief Program that can be allocated to locally purchase medications to be used on local nationals. The use of local-national medical supplies is not only cost-effective: It also bolsters the local economy, gives patients confidence and educates them in host-nation medicines. Admittedly, these local-national medications may not look as legitimate as such things as decongestant capsules (used to treat the symptoms of the common cold), which are a highly sought-after commodity in community trading circles because of their multi-colored appearance.

The nonlethal operations of our task force are not intended to supplant or undermine local providers and medical operations but rather to build confidence and support for the elected government and legitimate government operations. Additionally, with judicious use of medical care and application of basic comprehensive care, the local population will begin to feel a true investment in their community. As a by-product of these operations, security will be enhanced as the locals build a partnership with the Special Forces teams and their attached Afghan National Army units.

Another benefit of running the clinics is the unparalleled level of experience and training our medics receive. The breadth of exposure to trauma and infectious diseases alone is unlike anything they see in clinics in the United States. Many of the children who present to our clinics have never received medical evaluations or care in



Lost in Translation To avoid confusing their patients, providers work closely with interpreters. Their assistance is invaluable, both for assistance and for technical communication.

Photo courtesy Sean Keenan.

their lives. Malnutrition, childhood illnesses and genetic abnormalities are seen in their raw forms. Our medics get training in pain control and procedural sedation skills, and many become more adept in the use of ketamine, opiates and benzodiazepines for procedural sedation, without which many of our procedures would not be possible. Cases of severe burns, abscesses and blunt trauma are commonplace, while exposure to pediatric patients is universal. A couple of our clinics even rival the experience of big-city hospitals that deal with the injuries of “knife and gun clubs” in America.

With the rotation of our medical officers (battalion surgeon, battalion physician’s assistant and augmentee providers), SF medics take advantage of an experience comparable to medical-proficiency-training rotations in the U.S. Considering the limitations of peacetime training, the daily experiences in these clinics are unmatched. Properly regulated, duty in these clinics

gives the medic a superb learning experience that will build on an already solid background of medical education. The training experience benefits the SF medics as much as it does the patient themselves.

CONCLUSION

Although it is not a blueprint for conventional forces’ application of medical assets in the Global War on Terrorism, the use of SF medical assets is vital to the overall counterinsurgency strategy of Task Force 31. The operational relevance of our seemingly permissive rules of eligibility, with regard to the provision of local-national health care in this austere and hostile environment, cannot be overlooked. Over two rotations in support of Operation Enduring Freedom, and at 14 firebase clinics, we have evaluated close to 50,000 patients, a significant portion of the population in southern Afghanistan in these remote villages.

Author’s note: *I wish to acknowledge the multiple discussions I have had with my physician colleagues in this theater of operations and especially the Special Forces medical sergeants of the 1st Battalion, 3rd Special Forces Group, for teaching me more about the application of host-nation medical care than they probably realize.*

Reference

¹<https://www.cia.gov/cia/publications/factbook/geos/af.html>

Major Sean Keenan received his commission in 1991 from the U.S. Military Academy. He graduated from the Uniformed Services University of the Health Sciences, in Bethesda, Md., in 1995. He served as the battalion surgeon for the 1st Battalion, 1st SF Group in Okinawa from 1996–1999. After completion of his emergency-medicine residency at Brooke Army Medical Center, Fort Sam Houston, Texas, he served as staff emergency physician, Womack Army Medical Center, Fort Bragg, for two years. He then was assigned to his present position as the battalion surgeon of the 1st Battalion, 3rd SF Group. He recently completed his fourth wartime deployment in support of special-operations forces and his second consecutive tour as the Task Force 31 surgeon in Kandahar, Afghanistan.

Q Fever in Members of the United States Armed Forces Returning from Iraq

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Large numbers of armed forces personnel returning from southwest Asia may present with infections that are not endemic to the United States or that occur rarely and are under-diagnosed in the United States. We report two cases of acute Q fever in members of the U.S. military recently returned from Iraq. Because a number of recent reports suggest that the risk of Q fever may be higher than initially thought among U.S. forces deployed to this region, clinicians need to have a high index of clinical suspicion, an understanding of the available diagnostic tests, and knowledge regarding the methodology and capabilities of the laboratory to which specimens are submitted.

Zapor and Moran¹ recently published a concise review of the infectious diseases challenges associated with the current military operations in southwest Asia. Among infections not endemic to the United States, leishmaniasis and malaria are of particular concern. From 2002 to 2005, there were 827 confirmed cases of cutaneous leishmaniasis and five cases of visceral leishmaniasis among U.S. Army personnel serving in Afghanistan, Kuwait, and Iraq. There have been no reports of cases of malaria occurring in American Soldiers in Iraq.

Nosocomial infection with multidrug-resistant *Acinetobacter baumannii* occurs in U.S. hospitals, but it has emerged as a major problem among wounded troops and in military medical treatment facilities. Wound infections, respiratory infections, urinary tract infections, and osteomyelitis are among the common manifestations of infection with this organism, but a 2004 report described 102 patients with *A. baumannii* bacteremia admitted to military medical treatment facilities.² Nosocomial transmission of this organism within the Walter Reed Army Medical Center (Washington, DC) resulted in 53 infections, including four infections resulting in death.¹ Relatively little is known about the frequency with which U.S. forces in southwest Asia are developing other infections, such as Q fever.

CASE REPORT 1

In September 2003, a 39-year-old male member of the U.S. Army was evaluated in the Infectious Diseases

Clinic at David Grant U.S. Air Force Medical Center (Travis Air Force Base, CA) for a resolved febrile illness. He had been deployed to Iraq from April to July of 2003. While in Iraq, he lived and ate in the community. The house in which he lived bordered on what had once been a large sheep farm, and sheep carcasses were still present in the area. The farewell party that his Iraqi friends threw for him included the ceremonial slaughter of a sheep. He started weekly mefloquine therapy two weeks prior to entering Iraq, but stopped therapy two weeks prior to his return to the United States.

Two weeks after his return from Iraq, he developed sore throat, fever (temperatures to 39.2C), myalgia, chills, sweats, headache, and anorexia. He was seen in a primary care clinic on two occasions, received a diagnosis of a viral syndrome, and was treated with naprosyn. His only other medication was rabeprazole for gastroesophageal reflux disease. One week after the onset of symptoms, he developed a fever (temperature to 40C) and became listless. His wife took him to the nearest emergency department (at an outside facility), and he was subsequently admitted to the hospital.

The findings of a physical examination were remarkable for fever and tachycardia. Pertinent negative findings included no adenopathy, no abnormalities on lung auscultation, no cardiac murmurs, no organomegaly on abdominal examination, and no stigmata of endocarditis on skin examination. Laboratory studies revealed a WBC count of 4600 cells/mL (normal range, 4800–11,000



Figure 1 Chest radiograph demonstrating a right middle lobe infiltrate in patient 1.

cells/mL) with a normal differential; normal hemoglobin level and hematocrit; platelet count of 64,000 platelets/mL (normal range, 140,000–440,000 platelets/mL); prothrombin time of 10.8 s (normal range, 9.0–11.0 s); partial thromboplastin time of 28 s (normal range, 23.7–33.8 s); fibrinogen level of 472 mg/dL (normal range, 150–450 mg/dL); aspartate aminotransferase level of 343 IU/L (normal range, 15–41 IU/L); alanine transaminase level of 465 IU/L (normal range, 17–63 IU/L); alkaline phosphatase level of 267 IU/L (normal range, 38–126 IU/L); total bilirubin of 0.6 mg/dL (normal range, 0.4–2.0 mg/dL); and serum creatinine level of 1.1 mg/dL (normal range, 0.9–1.3 mg/dL). Blood cultures showed no growth, and thick and thin smears for malaria were unrevealing. Plain films of the chest demonstrated a right middle lobe infiltrate (Figure 1), and CT of the abdomen with contrast demonstrated hepatomegaly. Serological testing was performed for viral hepatitis and cytomegalovirus; these demonstrated immunization against hepatitis B and past exposure to cytomegalovirus. A liver biopsy demonstrated numerous nonspecific granulomas without fibrin rings (Figure 2). They were distributed in the midzonal region, were confined to the parenchyma, and did not satellite on either the central veins or the portal areas. The most characteristic lesion of *Coxiella burnetii* liver involvement, the fibrin-ring or “doughnut” granuloma, which is composed of a fat vacuole surrounded by a ring of fibrin, epithelioid cells, giant cells, and neutrophils,³ was not appreciated. The patient defervesced after 72 hours of therapy with piperacillin-tazobactam. He received a total of eight days of piperacillin-tazobactam and was discharged with a six-day course of levofloxacin.

When examined in the Infectious Diseases Clinic eight weeks after onset of his illness, the patient had a

mildly decreased energy level but was otherwise asymptomatic. Serum transaminase levels had returned to normal. Serological testing was performed for organisms known to cause fever and granulomatous hepatitis, including *Brucella* species, *Francisella tularensis*, *C. burnetii*, *Treponema pallidum*, HIV, cytomegalovirus, Epstein-Barr virus, the hepatitis viruses, *Coccidioides immitis*, *Histoplasma capsulatum*, and *Toxoplasma gondii*. The serum sample that was tested for *C. burnetii* antibodies was submitted to the Laboratory Corporation of America (LabCorp; Research Triangle Park, NC); the IgG anti-phase I titer was elevated to a greater extent than the anti-phase II titer (1:2048 vs. 1:128), suggesting chronic Q fever (Table 1). The results of the *Brucella abortus* IgM ELISA performed at LabCorp were equivocal (Table 2). Banked serum samples were then sent to several reference laboratories for further testing. Transthoracic and transesophageal echocardiograms did not suggest a valvular vegetation.

The patient received one month of doxycycline therapy. The results of subsequent serological testing suggested acute, resolved Q fever. The anti-phase II titer was the same or higher than the anti-phase I titer for serum samples tested at three other laboratories (Table 1). No circulating *C. burnetii* was detected via electrochemiluminescence assay and PCR⁸ of blood samples tested at the United States Army Medical Research Institute for Infectious Diseases (Fort Detrick, MD). The serological test results obtained from a second laboratory that were negative for *Brucella* species (Table 2), multiple sets of sterile cultures of blood obtained during the acute phase of illness, and the convincing Q fever serological test results led us to

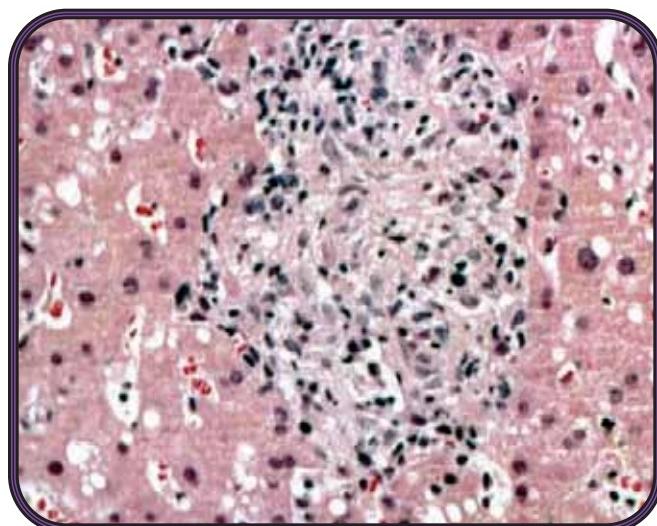


Figure 2. High-power photomicrograph of a hematoxylin and eosin stain of a percutaneous liver biopsy sample obtained from patient 1 revealing nonspecific granulomas without fibrin rings.

Table 1. Serological test results for Q fever in patient 1.

Weeks after onset	Laboratory	Test	Result (laboratory-provided diagnostic titer)	
			Phase I	Phase II
8	Laboratory Corporation of America, Research Triangle Park, NC	Focus Diagnostics Q Fever IFA IgG (Focus Diagnostics, Cypress, CA)	1:2048 ($\geq 1:16$)	1:128 ($\geq 1:16$)
8	Armstrong Laboratory, Epidemiologic Research Division, Brooks Air Force Base, TX	Focus Diagnostics Q Fever IFA IgM (Focus Diagnostics, Cypress, CA)	1:128 ($\geq 1:16$)	1:512 ($\geq 1:16$)
8	Centers for Disease Control and Prevention, Atlanta, GA	Noncommercial IFA IgG [4, 5]	1:4096 ($\geq 1:128$)	1:4096 ($\geq 1:128$)
16	US Army Medical Research Institute for Infectious Diseases, Fort Detrick, MD	Noncommercial ELISA IgG [6]	1:2048 ($\geq 1:512$)	1:16384 ($\geq 1:1024$)
16	US Army Medical Research Institute for Infectious Diseases, Fort Detrick, MD	Noncommercial ELISA IgM [6]	1:512 ($\geq 1:128$)	1:512 ($\geq 1:256$)
50	Laboratory Corporation of America, Research Triangle Park, NC	Focus Diagnostics Q Fever IFA IgG, (Focus Diagnostics, Cypress, CA)	1:2048 ($\geq 1:16$)	1:2048 ($\geq 1:16$)
62	Centers for Disease Control and Prevention, Atlanta, GA	Noncommercial IFA IgG [4, 5]	1:4096 ($\geq 1:128$)	1:8192 ($\geq 1:128$)
62	Armstrong Laboratory, Epidemiologic Research Division, Brooks Air Force Base, TX	Focus Diagnostics Q Fever IFA IgM (Focus Diagnostics, Cypress, CA)	1:16 ($\geq 1:16$)	1:32 ($\geq 1:16$)
94	Laboratory Corporation of America, Research Triangle Park, NC	Focus Diagnostics Q Fever IFA IgG, (Focus Diagnostics, Cypress, CA)	1:128 ($\geq 1:16$)	1:512 ($\geq 1:16$)

NOTE. IFA, immunofluorescence assay.

exclude the diagnosis of brucellosis.

Although he returned to his usual state of health by January 2004, the patient presented to the hospital in August 2004 with complaints of several months of sore throat, unrefreshing sleep, anhedonia, decreased energy, impaired concentration and short-term memory, decreased motivation at work, and dull bilateral hip aching. The results of a complete blood count, serum chemistry results, liver function test results, thyroid stimulating hormone level, erythrocyte sedimentation rate, and C-reactive protein level were all within normal limits. The patient met

plaining of four days of fever, headache, myalgia, malaise, and anorexia and one day of loose stools. He had returned from a three-month tour in Iraq approximately three weeks prior to the onset of this illness.

While in Iraq, the patient had remained within the base compound and had no notable food or animal exposures. He did report multiple mosquito and sandfly bites and had not taken the doxycycline prescribed for malaria prophylaxis. Upon returning to the United States, his activities included swimming in a lake, but there had been no recent camping or hunting.

He had a pet dog and rabbit, both of which were healthy and not recently parturient. His wife had a self-limited febrile illness one week prior to his evaluation.

On physical examination, the patient had a temperature of 39.3°C and appeared to be mildly ill but had no localizing signs of infection. Pertinent negative findings included no adenopathy, no abnormalities on lung auscultation, no cardiac murmurs, no organomegaly on abdominal examination, and no stigmata of endocarditis on skin examination. Laboratory studies revealed a WBC count of 3900 cells/mL (normal range, 4000–14,000 cells/mL) with

Table 2. Serological test results for *Brucella* species in patient 1.

Weeks after onset	Laboratory	Test	Result (cutoff titer)
8	Laboratory Corporation of America, Research Triangle Park, NC	Panbio <i>Brucella</i> IgG ELISA [7] (Panbio, Windsor, Brisbane, Australia)	Negative (NA)
8	Laboratory Corporation of America, Research Triangle Park, NC	Panbio <i>Brucella</i> IgM ELISA [7] (Panbio, Windsor, Brisbane, Australia)	Equivocal (NA)
8	Armstrong Laboratory, Epidemiologic Research Division, Brooks Air Force Base, TX	BD Febrile Antigens for Febrile Antigen Agglutination Tests (Becton, Dickinson and Company, Sparks, MD)	<1:80 ($\geq 1:80$)

NOTE. NA, not applicable.

the revised Centers for Disease Control and Prevention criteria for chronic fatigue syndrome and was offered cognitive behavioral therapy and treatment with antidepressants, both of which he declined. He did not meet Diagnostic and Statistical Manual of Mental Disorders IV criteria for major depressive disorder or post-traumatic stress disorder. His symptoms improved somewhat over a six-month period with exercise.

CASE REPORT 2

In September 2004, a 35-year-old male member of the U.S. Air Force was admitted to our facility com-

76% neutrophils; normal hemoglobin and hematocrit; platelet count of 123,000 platelets/mL (normal range, 150,000–450,000 platelets/mL); erythrocyte sedimentation rate of 28 mm/h (normal range, 0–15 mm/h); prothrombin time of 14.6 s (normal range, 10.7–14.7 s); partial thromboplastin time of 28.6 s (normal range, 22.5–42.5 s); aspartate aminotransferase level of 176 IU/L (normal range, 15–41 IU/L); alanine transaminase level of 157 IU/L (normal range, 17–63 IU/L); alkaline phosphatase level of 171 IU/L (normal range, 38–126 IU/L); total bilirubin level of 0.6 mg/dL (normal range, 0.4–2.0 mg/dL); and serum creatinine level of 1.1 mg/dL (normal range, 0.9–1.3 mg/dL).

Table 3. Serological test results for Q fever in patient 2.

Weeks after onset	Laboratory	Test	Result (laboratory-provided diagnostic titer)	
			Phase I	Phase II
3	Armstrong Laboratory, Epidemiologic Research Division, Brooks Air Force Base, TX	Focus Diagnostics IFA IgM (Focus Diagnostics, Cypress, CA)	1:16 ($\geq 1:16$)	1:128 ($\geq 1:16$)
5	Laboratory Corporation of America, Research Triangle Park, NC	Focus Diagnostics IFA IgG (Focus Diagnostics, Cypress, CA)	1:128 ($\geq 1:16$)	<1:16 ($\geq 1:16$)
5	Armstrong Laboratory, Epidemiologic Research Division, Brooks Air Force Base, TX	Focus Diagnostics IFA IgM (Focus Diagnostics, Cypress, CA)	1:16 ($\geq 1:16$)	1:64 ($\geq 1:16$)
5	California Viral and Rickettsial Disease Laboratory, Richmond, CA	Focus Diagnostics IFA IgG (Focus Diagnostics, Cypress, CA)	<1:64 ($\geq 1:64$)	1:4096 ($\geq 1:64$)
10	California Viral and Rickettsial Disease Laboratory, Richmond, CA	Focus Diagnostics IFA IgG (Focus Diagnostics, Cypress, CA)	<1:64 ($\geq 1:64$)	1:1024 ($\geq 1:64$)

NOTE. IFA, immunofluorescence assay.

An abdominal ultrasound revealed diffuse echogenic portal triads consistent with the “starry sky” appearance seen in acute hepatitis.

Multiple thick and thin smears for malaria, blood cultures, and stool cultures had negative results. Serological testing for leptospirosis, cytomegalovirus, Epstein-Barr virus, HIV, *Bartonella* species, *Brucella* species, and *Leishmania* species was performed. The patient received empirical therapy with ceftriaxone 2g IV daily for a seven-day course, and his fever resolved within 48h. The remainder of the patient’s hospitalization was notable for transient, self-limited proteinuria (maximum 24h urine protein, 1.7 g).

One week after discharge from the hospital, the patient remained afebrile. The results of urinalysis, a complete blood count, and liver function tests had normalized. The results of a *B. abortus* IgM ELISA were equivocal, and the patient initiated therapy with doxycycline and rifampin (he received a one-month course). All other acute-phase serological test results were unremarkable.

Our experience with the first case patient prompted us to have serum samples tested for the presence of *C. burnetii* antibodies (table 3). As in the earlier case, the results of serological testing for *C. burnetii*, performed by LabCorp, were suggestive of chronic infection (anti-phase I IgG titer, 1:128; anti-phase II IgG titer, <1:16). The results of serological testing at two other laboratories were consistent with acute Q fever, with significantly elevated anti-phase II titers and normal or minimally elevated anti-phase I titers. These results strongly suggest that this was a case of acute, resolved Q fever. Brucellosis was again excluded on the basis of negative serological test results obtained at two other laboratories (table 4), sterile blood cultures, and compelling serological test results for Q fever.

DISCUSSION

Q fever is a worldwide zoonotic disease caused by the rickettsial pathogen *C. burnetii*.⁹ The reservoir for infection is broad and not fully known; it includes mammals, birds, and arthropods. The true incidence of infection is unclear and most likely underestimated. Humans frequently acquire the infection from sheep and cows via inhalation of aerosolized infectious material or the ingestion of contaminated milk products. This agent is highly infectious; a single organism can cause illness. *C. burnetii* infection is often subclinical or mild and is often self-limited. Common clinical presentations include a nonspecific febrile illness, atypical pneumonia, and hepatitis. Chronic infection can occur and most commonly involves the heart, arteries, liver, and bone.

Q fever has military relevance because of its potential as a bioterrorism agent and because of the risk for natural infection in deployed personnel. An unclassified report from the Defense Intelligence Agency in 1990 assessed the expected infectious disease threat of a short-duration military operation in northern Iraq.¹⁰ It suggested that endemic Q fever posed a minor risk to military personnel under normal circumstances but might pose an increased threat to nonconventional forces. In 1991, the Defense Intelligence Agency reported that the results of tests performed on blood samples obtained from 21 of 130 Iraqi military personnel involved in the Persian Gulf War suggested previous exposure to *C. burnetii*.¹¹ The conclusion was that Q fever posed a relatively low risk to U.S. personnel deploying to that region. The fact that only three cases of Q fever were reported in U.S. troops involved in the Persian Gulf War^{12,13} seemed to confirm these analyses.

Table 4. Serological test results for *Brucella* species in patient 2.

Weeks after onset	Laboratory	Test	Result (cutoff titer)
1	Laboratory Corporation of America, Research Triangle Park, NC	Panbio <i>Brucella</i> IgG ELISA [7] (Panbio, Windsor, Brisbane, Australia)	Negative (NA)
1	Laboratory Corporation of America, Research Triangle Park, NC	Panbio <i>Brucella</i> IgM ELISA [7] (Panbio, Windsor, Brisbane, Australia)	Equivocal (NA)
3	Laboratory Corporation of America, Research Triangle Park, NC	Panbio <i>Brucella</i> IgG ELISA [7] (Panbio, Windsor, Brisbane, Australia)	Negative (NA)
3	Laboratory Corporation of America, Research Triangle Park, NC	Panbio <i>Brucella</i> IgM ELISA [7] (Panbio, Windsor, Brisbane, Australia)	Positive (NA)
3	Armstrong Laboratory, Epidemiologic Research Division, Brooks Air Force Base, TX	BD Febrile Antigens for Febrile Antigen Agglutination Tests (Becton, Dickinson and Company, Sparks, MD)	<1:80 ($\geq 1:80$)
5	California Microbial Diseases Laboratory, Richmond, CA	Non-commercial tube agglutination	1:40 ($\geq 1:80$)
5	Armstrong Laboratory, Epidemiologic Research Division, Brooks Air Force Base, TX	BD Febrile Antigens for Febrile Antigen Agglutination Tests (Becton, Dickinson and Company, Sparks, MD)	<1:80 ($\geq 1:80$)

NOTE. NA, not applicable.

Recent data; however, suggest that Q fever may pose more of a threat to U.S. forces in Iraq than previously thought. An epidemic of Q fever identified among soldiers from the Czech Republic serving in the United Nations Stabilization Force at four bases in Bosnia and Herzegovina in 1997 highlighted the possibility that personnel involved in nonconventional activities, such as prolonged peacekeeping missions, may be at increased risk, compared with personnel involved in short-term, conventional military operations.¹⁴ Over a two-month period, there were 14 symptomatic and 12 subclinical cases among 610 personnel (infection rate, 4.3%). A sheep farm with active lambing was located in close proximity to the base with the highest attack rate. The authors hypothesized that helicopter operations at a nearby landing zone may have generated infectious aerosols and, thus, been a cause of the outbreak.

Anderson and colleagues described 62 cases of pneumonia (19 severe cases and 43 nonsevere cases) in U.S. military members in Iraq between 1 March and 20 August 2003 [15, 16]. Eight patients (three with severe cases and five with nonsevere cases) were found to have serological evidence suggesting *C. burnetii* as the etiologic agent. All eight patients initially presented in northern Iraq, the only region in the country suitable for grazing of livestock, rather than the nomadic herding common elsewhere. This led to the hypothesis that the larger concentrations of livestock in the northern areas might translate into a higher risk of transmission of *C. brunetti* to humans because of a higher chance of contact with infected animals. The three patients who presented with severe pneu-

monia had significant environmental exposures: all three patients reported close contact with animals (dogs, cats, sheep, goats, or camels), two reported tick bites within 30 days prior to onset of illness, and one reported ingestion of raw sheep's milk.

One of our patients reported significant environmental exposures, as well. His exposures were likely related to the fact that he was living in the community for four months. Along with the Czech epidemic in Bosnia and Herzegovina in 1997 and the cases of pneumonia among U.S. forces in 2003, the two cases that we present here support the theory that Q fever poses an increased threat to non-conventional forces. We concur with the recommendation of Anderson et al.¹⁶ that further studies are indicated, including serosurveys of military units with cases using stored serum samples obtained before and after deployment, a case-control study to assess the risk factors for Q fever in U.S. forces in Iraq to allow development of effective prevention strategies, and a longitudinal study to evaluate the occurrence of chronic fatigue syndrome and long-term health sequelae.

The diagnosis of Q fever is made primarily by serological testing results; immunofluorescence assay is currently the method of choice.^{17,18} Acute and chronic Q fever can be differentiated via serological testing results because of the antigenic shift or phase variation exhibited by *C. burnetii*. In acute infection, IgG and IgM anti-phase II antibody titers are elevated one to two weeks after the onset of infection; seroconversion occurs by the third week in 90% of cases. An IgG anti-phase II antibody titer of $\geq 1:200$ and an IgM anti-phase II antibody titer of $\geq 1:50$ are con-

sidered to be suggestive of acute infection. In cases of chronic infection, the IgG anti-phase I antibodies are predominant, and titers of $\geq 1:800$ are considered to be significant. Antibody titers generally peak one to two months after the onset of symptoms. The titers usually decrease gradually over the following year; IgM antibodies disappear first, but IgG titers may remain positive for years. Chronic infection is suggested when high levels of phase I antibodies persist.

Serological test results for each of our patients varied considerably among laboratories (even among those laboratories using the same test kit). Most notably, initial results from LabCorp suggested chronic infection with an anti-phase I titer elevated to a greater magnitude than the anti-phase II titer, whereas results from other laboratories demonstrated the opposite pattern, suggesting acute *C. burnetii* infection. In both cases, the *B. abortus* IgM ELISA results were falsely equivocal or positive, suggesting cross-reactivity with antibodies generated against *C. burnetii*.

In summary, Q fever poses more of a threat to U.S. forces deployed in Iraq than was initially thought. Although it is important to suspect the diagnosis in the right clinical setting, a clinician must also have an understanding of the methodology and capabilities of the available tests and the laboratories to which specimens are submitted.

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REFERENCES

1. Zapor MJ, Moran KA. Infectious diseases during wartime. *Curr Opin Infect Dis* 2005;18:395–9.
2. Centers for Disease Control and Prevention. *Acinetobacter baumannii* infections among patients at military medical facilities treating injured U.S. service members, 2002–2004. *MMWR Morb Mortal Wkly Rep* 2004;53:1063–6.
3. Lefkowitch JH. The liver in systemic disease and pregnancy. In: Scheuer PJ, Lefkowitch JH, eds. Liver biopsy interpretation. 6th ed. London: W.B. Saunders, 2000:284–322.
4. Sawyer LA, Fishbein DB, McDade JE. Q fever in patients with hepatitis and pneumonia: Results of laboratory-based surveillance in the United States. *J Infect Dis* 1988;158:497–8.
5. Nicholson WL, Comer JA, Sumner JW, et al. An indirect immunofluorescence assay using a cell culture-derived antigen for the detection of antibodies to the agent of human granulocytic ehrlichiosis. *J Clin Microbiol* 1997;35:1510–6.
6. Waag D, Chulay J, Marrie T, England M, Williams J. Validation of an enzyme immunoassay for serodiagnosis of acute Q fever. *Eur J Clin Microbiol Infect Dis* 1995;14:421–7.
7. Araj GF, Kattar MM, Fattouh LG, Bajakian KO, Kobeissi SA. Evaluation of the PANBIO Brucella immunoglobulin G (IgG) and IgM enzyme-linked immunosorbent assays for diagnosis of human brucellosis. *Clin Diagn Lab Immunol* 2005;12:1334–5.
8. Courtney BC, Smith MM, Henchal EA. Development of internal controls for probe-based nucleic acid diagnostic assays. *Anal Biochem* 1999;270:249–56.
9. Wallace MR, Hale BR, Utz GC, et al. Endemic infectious diseases of Afghanistan. *Clin Infect Dis* 2002;34:S171–207.
10. Defense Intelligence Agency, Armed Forces Medical Intelligence Agency. Medical threat assessment—Northern Iraq. Available at: http://www.gulflink.osd.mil/declassdocs/dia/19950825_950825_0146pgv_90d.html. Accessed 17 April 2006.
11. Defense Intelligence Agency, Armed Forces Medical Intelligence Agency. Final report: analysis of Iraqi military blood samples. Available at: http://www.gulflink.osd.mil/declassdocs/dia/19950901/950901_0600rpt_91d.html. Accessed 17 April 2006.
12. Hyams KC. Gulf War risk factor report. Gulf War Review newsletter 2001. Available at: <http://www1.va.gov/gulfwar/docs/RiskFactor5.doc>. Accessed 7 February 2006.
13. Ferrante MA, Dolan MJ. Q fever meningoencephalitis in a soldier returning from the Persian Gulf War. *Clin Infect Dis* 1993; 16:489–96.
14. Splino M, Beran J, Chlibek R. Q fever outbreak during the Czech Army deployment in Bosnia. *Mil Med* 2003;168:840–2.
15. Anderson AD, Smoak B, Shuping E, Ockenhouse C, Petruccelli B. Q fever and the U.S. Military. *Emerg Infect Dis* 2005;11:1320–2.
16. Anderson AD. Q fever in OIF-deployed Soldiers: An emerging disease of military importance. Available at: http://www.dsjf.org/IZ_Diseases/Q%20Fever%20in%20OIF%20Deployed%20Soldiers%20Emerging%20Threat.pdf. Accessed 31 May 2006.
17. Fournier PE, Marrie TJ, Raoult D. Diagnosis of Q fever. *J Clin Microbiol* 1998;36:1823–34.
18. Maurin M, Raoult D. Q fever. *Clin Microbiol Rev* 1999;12:518–53.

Diagnosis: Field Pharmacy Congestion No Room to Wait

Charles L Halcome, NREMT-P, IDMT

Allow me to take you deep into an African village: it's 1000 hrs and already 113 degrees F with no relief from the sun. Flies are buzzing around and you really don't feel well as the sun continues to intensify over you and your children as you trek to the village center to see the American doctors. The crowds are already forming and there are thousands of people standing, hoping to be



seen. It's chaotic, confusing, and loud. As you wait, you and your children see the Americans running around trying to set up the clinic and local military standing around with guns. You move to the staging area, and behind you the crowds chant and cheer with hopes of being seen also. As you arrive at the staging area you wait in yet another location to begin your visit with the doctors. It's finally your turn and you move forward to the screening area. You are weighed and a thermometer is placed under your tongue, then the same for each of your children. You finally move forward to see the providers. They give you a generalized exam and try to ask you questions about your medical history, but you don't understand what they are asking for. They write



more information on the note that they gave you outside. The doctor is trying to tell you how to take care of you and your children's ailments, but the line is quickly backing up behind you as the doctor struggles to explain and you struggle to understand. Next you move to the pharmacy where you see your fellow villagers nervously swallowing pills and their children spitting up the pink liquids the Americans are trying to give them.



As SOF troops in SOCEUR have steadily begun to pick up medical civic action missions, it came to my attention that no one has really put out any information regarding their lessons learned and experiences. Therefore, during my missions I took detailed notes to put out in this forum. To give you the biggest bang for your buck



Medications packed in Pelican boxes

to opening the pharmacy, how to gain the trust of the patients you will be seeing, logistical issues you will face to include crowd control and manning, and wrap up with a few lessons learned from the road.

Your arrival to the villages prior to opening the pharmacy may be overwhelming. As you arrive you may be greeted by thousands of people waiting to see you. So how do you control the chaos? First, don't rush. Get a good overview of the proposed site and think about the flow knowing that all patients will process through the pharmacy. As you pack out, consider using Pelican rifle cases; they allow for easy transportation and organization of meds by class. Pack some 550 cord or engineer tape to route your waiting lines, keeping some sort of crowd control and organization. Another consideration while performing site set-up is how you will house the pharmacy to protect you and your patients from the wind and sun. You may need a waiting area due to the time it takes to administer the meds, especially to small children, and the delay the language barrier creates.

I've decided to start with the pharmacy. In the pharmacy I found several processes that can only get better by sharing info that will help the next teams. In this article I plan to focus on events prior

In the villages many of the diagnoses and treatments are common. Pre-opening meds and packaging will be a real time saver. Meds like ibuprophen, multi-vitamins, and Tylenol can be packaged and labeled to ease the on-site work load. If you have meds like mebendazole in blister packs, break them open and package them in large quantities; you'll be surprised at how much you will use. Looks like we're ready to open the pharmacy, but before we can do that, who should be working there?

In our recent operation, a relatively large group with four providers seeing over 100 patients an hour, we needed no less than four trained medical professionals and two translators. Perhaps the most important players in the pharmacy are the translators. At this stage the translators need to be knowledgeable about the meds you are administering and what you're trying to accomplish. As for the medical team, one member's sole job is preparation, including pulverizing with mortar and pestle if needed and mixing meds for small children. The dispenser's job is to get the medications down the patient's throats. Each of these positions can be doubled to catch-up with long waiting lines. A practice we used which really helped was to



Pharmacy staff meeting with Peace Corps

send a team into the pharmacy waiting line and administer common meds, like deworming and vitamin A, being sure to annotate what they dispensed on the patient's "treatment record." Now that we have the logistics worked out, let's talk about opening the pharmacy.

Several issues that arose in every village as we opened the pharmacy were resolved by gaining the trust of the villagers. The best way we found to gain trust was by word of mouth through the villagers that had already been treated. Until we could get the word out through patients,

we relied on the local village leaders and elders to share their experiences with their people, since many of the villages have been visited by organizations providing U.S. medicines with great success in the past. The Peace Corps can assist by helping to gain the trust of the villagers. The Peace Corps volunteers bring a lot of tools with them to help with this type of mission; they speak the local dialect and have built a rapport with the women and children. Having someone who can help convey instructions for taking medications is priceless.

Here are a few pieces of knowledge and planning tips I have collected along the way that you may find useful. One that may seem trivial but is extremely helpful is to have pre-written prescriptions that can be used to track a patient from check-in to check-out at the pharmacy. On this pseudo record you can write weight, temperature, and something to describe/identify the patient such as the color of their clothing. At the end of the day this “record” can be



used to collect data such as number of patients seen, common ailments, and medications used to assist in re-supply. The real time saver that you can put on this “record” would be common prescriptions that are in your formulary. Another tip is to know the meds in your formulary well enough to know what can be compounded safely. My last tip is about how to improve the taste of mixed meds. Mixing in a little flavored drink mix will aid in getting the children to drink them, however due to their bland diets, sweet mixes (i.e., fruit punch) tend to work better than tart/sour (i.e., lemon-lime).

To recap and leave you with the big pharmacy picture, I’d like to put you back in the patients place for just a moment. Let me take you back to that same place and see how applying this information may have improved the set-

ting for your medical humanitarian mission. It’s 100 degrees F in the shade of the tarp you’ve provided. It is a welcome respite from the blazing sun and the flies buzzing around when you already don’t feel well as the sun comes up while you and your children wait to see the American doctors. The lines are already forming where the local military has placed a cordon and there are thousands of people standing about hoping to be seen. As you wait, you and your children are quickly evaluated by a Medic and determined to be in need of care. You move to a staging area, behind you the crowds chant and cheer with hopes they will also be seen. As you arrive at the staging area, you wait in yet another line to begin your visit with the doctors. It’s finally your turn and you move forward to the screening area. You and your children are weighed and have your temperatures taken. You finally move forward to see the providers. They give you a generalized exam as they gather your history through an interpreter. They write some information on the note that they gave you outside. You get some instructions about the way to take care of your ailments. Next you move to the pharmacy where they are mixing medications and passing out pills, soap, and a small drink of water. I hope by reviewing a pharmacy process that we worked out over the course of many days and over 2600 patients, you will be better prepared for success on your next medical civic action mission.

Medical civic action missions are not exceedingly difficult, but, they definitely require a skill set that we’ve never been taught. Given the unique nature of every mission, it seems the best way to prepare is by reviewing many different scenarios; I’ve shared mine, now I hope to read about yours soon.



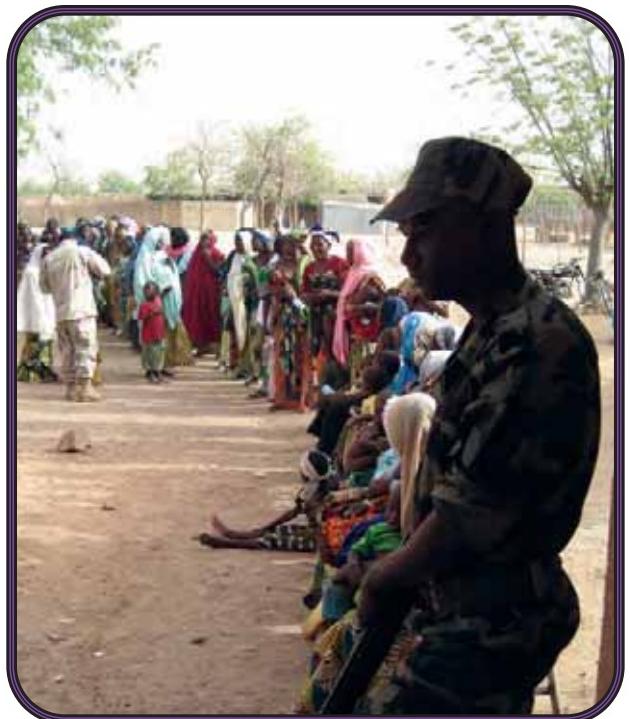
Pharmacist working with aid of an interpreter.



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Special Operations Medical Association (SOMA)
Robert Saum, COL (RET) MSC, President

The SOMA Convention will be held from 10 to 13 December 2007, at the Tampa Marriott Waterside, 700 South Florida Avenue. The component surgeon's conferences will be held the weekend prior (8, 9 December) in the same location. A special room discount is available at the military rate of \$83, if reserved before 20 November. When calling for reservations, please refer to "SOMA Conference." The number for reservations is (813) 221-4900, from 8 to 5pm EST. Register and obtain updates on the conference, including a tentative speakers list, at our website, WWW.SOMAON-LINE.ORG.

The SOMA Convention is still one of the best bargains in the country for CMEs. A total of 24 to 28 CMEs (exact number will be announced by 1 November) will be awarded for \$40 for Enlisted/Civilian Medics; \$60 for Non-Physician Officers; \$100 for Physicians; and \$500 for a Life Membership. We also now offer a Member Only (not attending conference) for \$35. Last year we attracted over 870 participants from around the world and expect to exceed that number in 2007. But book early, the SOMA room block is going quickly.

The SOMA Officers and the SOMA Board of Directors continually strive to make the SOMA Convention the pre-eminent gathering in the world for special operations medical personnel and others interested in our missions. As such, we continue to revise and update the annual meeting to make it more relevant to the operators' needs.

This year, due to very positive feedback from last year, we will expand the breakout and hands-on sessions from 1 day to 1½ days. The first 2½ days will feature our traditional lectures (now shortened from 50 minutes to 40) while the hands-on demos and breakout sessions will occur in the afternoon of day three and all of day four. We are especially excited about these hands-on sessions.

Also back by popular demand, are many of the sessions from last year. Popular sessions such as airway management, suture review, etc., will be repeated both afternoons of days three and four. This will allow participants greater flexibility in choosing the sessions that will be of greatest interest to them. Check out our website over the next few months to get a better idea of the sessions we will offer.

Another change will be in the uniforms required for attendance. Presenters and speakers will continue to wear Class A uniforms but all other military attendees can now wear ACUs or duty uniforms for the entire conference.

We hope to see you all there. Since conference registration and hotel reservations are running far ahead of last year, we urge you to make your reservations as soon as possible. Do it now, in fact!

We are always open to any of your suggestions. You can contact all of the SOMA Officers at the SOMA website.

=Educational Resources=

The following is a list of information resources for education and training opportunities.

This list is not endorsed by DOD or USSOCOM, nor can we vouch for the quality of their training.

Casualty Care Research Center
Department of Military and Emergency Medicine
Uniformed Services University
4301 Jones Bridge Road
Bethesda, Maryland, United States 20814-4799
Office: (301) 295-6263
Fax: (301) 295-6718
Web Site: www.casualtycareresearchcenter.org

CERTAC
P.O. Box 354
Drake, Colorado, United States 80515
Office: (970) 214-9355
Fax: None
Web Site: www.certac.com

Counter Force Training
3160 School Drive
Savanna, Illinois, United States 61074
Office: (888) 660-3442
Fax: (815) 273-3247
Web Site: www.counterforcetraining.org

Cypress Creek Advanced Tactical Team
c/o Cypress Creek EMS
16650 Sugar Pine Lane
Houston, Texas, United States 77090
Office: (281) 440-9650 Extension 156
Fax: (281) 440-7677
Web Site: www.ccatt.org

Direct Action Resource Center
6302 Valentine Road
North Little Rock, Arkansas, United States 72117
Office: (501) 955-0007
Fax: (501) 955-0080
Web Site: <http://www.darc1.com>

Gunsite Academy, Inc.
2900 West Gunsight Road
Paulden, Arizona, United States 86334
Office: (928) 636-4565
Fax: (928) 636-1236
Web Site: <http://www.gunsight.com>

Heckler & Koch, Inc.
International Training Division
21480 Pacific Boulevard

Sterling, Virginia, United States 20166-8903
Office: (703) 450-1900 Extension 293
Fax: (703) 406-2361
Web Site: <http://www.tacticalmedicine.com/>

HSS International, Inc.
P.O. Box 50 / # 337
Lake Arrowhead, California, United States 92352
Office: (909) 336-4450
Fax: (714) 242-1312
Web Site: <http://www.hssinternational.com>

Insights Training Center
P.O. Box 3585
Bellevue, Washington, United States 98009
Office: (425) 827-2552
Fax: (425) 827-2552
Web Site: <http://www.insightstraining.com>

Lion Claw Tactical
5900 East Virginia Beach Boulevard
Suite 408
Norfolk, Virginia, United States 23502
Office: (757) 321-2059
Fax: (757) 498-0059
Web Site: www.lionclawtactical.com

“Medic Up” Tactical Medic Training Course
3300 Via Giovanni
Corona, California, United States 92881
Office: (909) 340-9201
Fax: (909) 340-9201
Web Site: www.medicup.com

National Academy of Tactical Medical Response
3075 Shattuck Road
Suite 813
Saginaw, Michigan, United States 48603-3258
Office: (989) 585-4001
Fax: (989) 585-4001
Web Site: www.tacticalmedical.com

National Tactical Officer's Association
P.O. Box 797
Doylestown, Pennsylvania, United States 18901
Office: (800) 279-9127
Fax: (215) 230-7552
Web Site: <http://www.ntoa.org>

NWTC, Inc.
1844 North Nob Hill Road
Suite 406
Plantation, Florida, United States 33322
Office: (866) 328-2918
Fax: (866) 328-2918
Web Site: www.nwtcinc.org

Omega Tactical Consultants
7915 Trail Run Loop
New Port Richey, Florida, United States 34653
Office: (727) 243-6891
Fax: (727) 375-1577
Web Site: www.omegatacticalconsultants.com

Rescue Training, Inc.
9-A Mall Terrace
Savannah, Georgia, United States 31406
Office: (877) 692-8911
Fax: (912) 692-1338
Web Site: <http://www.emtt.org>

Spartan Group International
Applied Training and Consulting Division
P.O. Box 671
Mamers, North Carolina, United States 27552
Office: (877) 977-2782
Fax: None
Web Site: <http://www.spartangroup.com>

SERT Group International
P.O. Box 371231
Reseda, California, United States, 91337-1231
Office: (866) 500-5465
Fax: (818) 344-8099
Web Site: <http://thesertgroup.homestead.com>

Specialized Medical Operations, Inc.
P.O. Box 530520
Henderson, Nevada, United States 89053
Office: (702) 617-1655
Fax: (702) 920-7635
Web Site: www.specmedops.com

Special Operations Tactical Training International
P.O. Box 830
Dover, Tennessee, United States 37058-2716
Office: (931) 232-6593
Fax: (931) 232-6542
Web Site: www.sottint.com

STS Consulting
PMB Box 176
1981 Memorial Drive
Chicopee, Massachusetts, United States 01020

Office: (413) 531-8699
Fax: (413) 532-1697
Web Site: www.tactical-ems.com

Tac1Aid
157 Middle Road
Newbury, Massachusetts, United States 01922
Office: (978) 499-0492
Fax: None
E-mail: Tac1Aid@hotmail.com

Tactical Element, Inc.
380-H Knollwood Street
Suite 140
Winston Salem, North Carolina, United States 27103
Office: (336) 945-2289
Fax: (336) 945-2289
Web Site: www.tacticalelement.cc

Team One Network
620 Richards Ferry Road
Fredericksburg, Virginia, United States 22406
Office: (540) 752-8190
Fax: (540) 752-8192
Web Site: www.teamonenetwork.com

The Tactical EMS School
1309 Dawn Ridge Road
Columbia, Missouri, United States 65202
Office (573) 474-2436
Fax (573) 474-2436
Web Site: www.tactical-specialties.com

X-TEMS
P.O. Box 925
Loveland, Ohio, United States 45140
Office: (513) 583-3001 Extension 500
Fax: (513) 583-3012
Web Site: www.xtems4life.com

VETERINARY MEDICINE

K-911 Emergencies, Inc.
P.O. Box 8652
Jupiter, Florida, United States 33468-8652
Office: (561) 575-2514
Fax: None
Web Site: www.k911emergencies.com

The ResQ Shop
1051 Meadow West Drive
El Paso, Texas, United States 79932
Office: (915) 877-4312
Fax: (915) 877-4242
Web Site: www.theresqshop.com

SPECIAL OPERATIONS MEDICAL REFERENCE GUIDE

ADMINISTRATION

Hospital Emergency Preparedness and Response. Joseph A. Barbera. Jane's Information Group. 2003.
Contingency Planning Links & Resources: <http://www.businesscontingency.com/links.php>
Continuity, Contingency and Disaster Planning: <http://www.business-continuity-world.com/>
Disaster Planning Resources: <http://www.disaster-resource.com/>
Vulnerability Assessment: <http://www.ojp.usdoj.gov/odp/docs/vamreport.pdf>
Health and Disaster Preparedness Tools: <http://www.ahrq.gov/prep/>
Emergency Preparedness Planning: <http://www.bt.cdc.gov/planning/>
Hospital Readiness Planning: <http://www.aha.org/aha/issues/Emergency-Readiness/resources.html>
Positioning America's Healthcare System for Terrorism: <http://www.acep.org/NR/rdonlyres/0E7F8FEF-3104-4FB5-BFC3-91453EF55ADD/0/terrorismResponse.pdf>
Health Actions in Crisis: <http://www.who.int/hac/en/>
Analyzing Disrupted Health Services: http://www.who.int/hac/techguidance/tools/_disrupted_sectors/_en/_index.html
Bioterrorism Pre-Planning and Response: <http://www.interpol.int/Public/BioTerrorism/BioterrorismGuide.pdf>
Bioterrorism and Mass Casualty Preparedness in Hospitals: <http://www.fas.org/biosecurity/resource/documents/ad364.pdf>
Health Care Management Tools: <http://erc.msh.org/toolkit/>
Health Information Management Tools: <http://www.humanitarianinfo.org/IMToolbox/>
Improving Decision Making for Health: <http://www.phrplus.org/Pubs/eop5.pdf>
Health Systems Assessment: <http://healthsystems2020.org/manual.html>
Health Program Evaluation Tools: <http://evalweb.usaid.gov/resources/sources.cfm>
Management of Health Care Delivery: <http://www.who.int/management/en/>
Health Services Technology Assessment: <http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat>
Health Facilities Management Magazine: http://www.hfmmagazine.com/hfmmagazine_app/index.jsp

ALTERNATIVE MEDICINE

U.S. Center for Complementary and Alternative Medicine: <http://nccam.nih.gov/>
WHO Collaborating Centers for Traditional Medicine: <http://www.who.int/medicines/areas/traditional/collabcentres/en/>
Ethnobotany Resource Directory: <http://www.cieer.org/directory.html>
International Society of Ethnopharmacology: <http://www.ethnopharmacology.org/>
Society for Medical Plants Research: http://www.ga-online.org/links_en.html
Ethnopharmacology Journal: <http://www.sciencedirect.com/science/journal/03788741>
Ethnopharmacology Resources: <http://medicinus.info/research/areas/ethnopharmacology/>
Cornell's Poisonous Plants Database: <http://www.anisci.cornell.edu/plants/>
Traditional Healing Resources: <http://www.arctichealth.org/tm.php>

ANESTHESIOLOGY

American Society of Anesthesiologists: <http://www.asahq.org/>
Anesthesiology References: <http://www.asahq.org/Links/refsd.htm>
Anesthesiology Links: <http://www.asahq.org/Links/linksOfInterest.htm>
American Society of Regional Anesthesia and Pain Medicine: <http://www.asra.com/>
ASRAPM Links: <http://www.asra.com/links/index.html#indexes>

AVIATION MEDICINE AND PATIENT TRANSPORT

Certified Flight Paramedic Exam Study Guide. Lauri Montanez (Editor). National Flight Paramedics Association. 2002.
Critical Care Transport Field Guide. UMBC. Jones and Bartlett Publishers. 2001.
Air & Surface Patient Transport: Principles & Practice. Renee S. Holleran. Mosby. 3rd Edition. 2002.
Aerospace Medical Association: <http://www.asma.org/>
Association of Air Medical Services: <http://www.aams.org/>
Association of Flight Paramedics: <http://www.flightparamedic.org/>
School of Aviation Medicine: <http://usasam.amedd.army.mil/>
Clinical Considerations in Aeromedical Transport: <http://www.ccat-training.org.uk/ccat3.htm>
Medical Evacuation Links: <http://usasam.amedd.army.mil/medevac/interest.htm>

Medical Evacuation in Hostile Environments:

http://www.brooksidepress.org/Products/OperationalMedicine/DATA/operationalmed/Manuals/fm8_10_6/toc.pdf

Aviation Medicine Resources: http://www.nh-tems.com/Aviation_medicine.html

Flight Medic Resources: <http://www.flightweb.com>

Journal of Aviation, Space and Environmental Medicine: <http://www.asma.org/journal/index.php>

e-BOOKS:

Military Medicine: <http://www.brooksidepress.org/Military.htm>

Military Biodefense Manuals: <http://usamriid.detrick.army.mil>

NCBI Online Medical Bookshelf: <http://www.ncbi.nlm.nih.gov/sites/entrez?db=books>

National Library of Medicine: <http://www.nlm.nih.gov/>

National Academies Press – Books: <http://www.nap.edu/catalog/11063.html>

Merck/Medicus Online Portal: http://www.merckmedicus.com/pp/us/hcp/hcp_home.jsp

Free Books for Doctors: <http://www.freebooks4doctors.com/index.htm>

CHEMICAL BIOLOGICAL, NUCLEAR AND HAZARDOUS MATERIALS

Bioterrorism: A Guide for First Responders. Imaginatics Publishing. 2nd Edition. 2004.

Chemical and Biological Terrorism: Research and Development to Improve Civilian Medical Response. Institute of Medicine. Washington, DC. 1999.

Chemical/Nuclear Terrorism: Guide For First Responders. Imaginatics Publishing. 2003.

First Responders Guide to Weapons of Mass Destruction. Jeffrey A. Adams. American Society for Industrial Security. 2001.

HazMat Emergency Response Manual. Alan, B Jones. One-Off Books. 2006.

Hitting America's Soft Underbelly: The Potential Threat of Deliberate Biological Attacks Against the U.S. Agricultural and Food Industry. Peter Chalk.

Rapid Guide to Hazardous Chemicals in the Environment. Richard P. Pohanish. Wiley. 2nd Edition. 1997.

Special Operations for Terrorism and Hazmat Crimes. Chris Hawley. Red Hat Publishing. 2001.

Weapons of Mass Destruction and Terrorism Field Response Guide. Joseph A. Coccia. Jones and Bartlett. 2004.

Bioterrorism Emergencies Preparedness and Response: <http://www.bt.cdc.gov/bioterrorism/>

Chemical Emergencies Emergency Preparedness and Response: <http://www.bt.cdc.gov/chemical/>

Radiation Emergencies Emergency Preparedness and Response: <http://www.bt.cdc.gov/radiation/>

Clinician's Biosecurity Center, University of Pittsburgh: <http://www.upmc-cbn.org/>

Chemical and Biological Defense Information Analysis Center: <http://www.cbiac.apgea.army.mil/>

Poison Control Centers: <http://www.ipl.org/div/kidspace/poisonsafe/pccenters.html>

Poisonous Plants Database: http://www.cbif.gc.ca/pls/pp/poison?p_x=px

Materials Safety Data Sheets (MSDS): <http://www.msdssearch.com/Default.htm>

Toxicology Databases and Profiles: <http://www.atsdr.cdc.gov/toxpro2.html>

Hazardous Materials Database: <http://www.cameochemicals.noaa.gov/>

Center for Food Security and Public Health: (Agroterrorism, Foreign Animal Diseases, Zoonotic diseases) <http://www.cfsph.iastate.edu/About/purpose.htm>

Food Safety, Animal and Plant Health: <http://www.ipfsaph.org/En/default.jsp>

DENTISTRY

Assisting Dental Education and Dental Public Health in Developing Countries: A Symposium. Appropriate Health Resources and Technologies Action Group. 1981.

Emergency Dental Care: Diagnosis and Management of Urgent Dental Problems. Donald A. Falace Williams & Wilkins. 1994.

Maxillofacial and Dental Emergencies (Oxford Handbooks in Emergency Medicine. John E. Hawkesford. Oxford University Press, USA. 1994.

Traumatic Dental Injuries: A Manual. Jens O. Andreasen. Blackwell Publishing. 2nd Edition. 2003.

DERMATOLOGY

Atlas of Cancer of the Skin. Gunter Burg. Churchill Livingstone. New York. 2000.

Andrew's Diseases of the Skin: Clinical Dermatology. Richard B. Odom. Editor. Harcourt Health Sciences. Philadelphia. 2000.

Emergency Dermatology: A Rapid Treatment Guide. Alan B. Fleischer. Wiley. 2nd Revised Edition. 1997.

Global Dermatology: Diagnosis and Management; According to Geography, Climate, and Culture. Springer. 1994.

Skin Disease: Diagnosis and Treatment. Thomas P. Habif. Editor. Harcourt Health Sciences. Philadelphia. 2001.

Dermatology Atlas: http://www.brooksidepress.org/Products/OperationalMedicine/DATA/operationalmed_Manuals/GMOManual/clinical/Dermatology/AtlasofDermatology.htm

e- DIAGNOSIS

Merck Manuals Online: <http://www.merck.com/>

Psychological Guide <http://www.guidetopsychology.com/testing.htm>

Psych Tests and Assessments: <http://www.psywww.com/resource/bytopic/testing.html>

DISASTER MANAGEMENT

Community Leadership Tool for Disasters:

http://www.upmc-biosecurity.org/website/focus/community_engage/index.html

Disaster Central: <http://www.disaster-central.com/index.html>

Disaster Roundtable: <http://dels.nas.edu/dr/index.shtml>

Guidelines for Disasters http://www.paho.org/english/PED/tguidelines_menu.htm

Disaster Management Tools Online: http://www.hsc.usf.edu/nocms/publichealth/cdmha_toolkit_dm/Index_English.pdf

Emergency Management and Command Forms: http://www.emacintl.com/download_center/

Emergency & Disaster Management Links: http://ccs.tamu.edu/homeland_security/comprehensive.asp

Mass Prophylaxis Planning Guide: http://www.emsa.ca.gov/dms2/draft_mass_prophy_final.pdf

Mass Care and Shelter Guide: <http://www.cdsscounties.ca.gov/coplanners/>

Post-Disaster Research: <http://www.colorado.edu/hazards/publications/sp/sp39/>

DISASTER MEDICINE

Advanced Disaster Medical Response Manual for Providers. Susan M. Briggs. Editor. Harvard Medical International Trauma & Disaster. 2003.

Disaster Medicine, Gregory Ciottone. Editor. Mosby. 2006.

Disaster Medicine. David E. Hogan. Lippincott Williams and Wilkins. 2002.

Handbook of Disaster Medicine. J. De Boer. Brill Academic Publishers. 2000.

Medical Response to Terrorism: Preparedness and Clinical Practice. Daniel C. Keyes. Lippincott Williams & Wilkins. 2004.

Center for Disaster Medicine: <http://hsc.unm.edu/som/cdm/index.shtml>

Pre-Hospital and Disaster Medicine: <http://pdm.medicine.wisc.edu/home.html>

Center for Disaster and Humanitarian Assistance: <http://www.cdham.org/>

Disaster Management and Humanitarian Assistance: <http://coe-dmha.org/>

Journal of Disaster Medicine: <http://www.dmphp.org/>

Disaster Medicine Links: <http://pdm.medicine.wisc.edu/links.html>

DIVING MEDICINE

Adjunctive Therapy for Decompression Illness Without a Chamber. Report of the UHMS Adjunctive Therapy Committee. Richard E. Moon, M..D. USSOCOM

Arctic Underwater Operations. Louis Rey Editor. Springer. 1985.

Assessment of Diving Medical Fitness for Scuba Divers and Instructors. Ernest S. Campbell. Best Publishing Company. 2006.

Diving Medicine by Alfred A. Bove and Jefferson Davis

NOAA Diving Manual, James T. Joiner. Editor. 4th Edition, National Technical Information Service. 2001.

Undersea and Hyperbaric Medical Society: <http://www.uhms.org/>

Diving Medicine Links: <http://scuba-doc.com/lnks.html>

Diving Diseases Research Center: <http://www.ddrc.org/>

Diving Medicine Symptoms and Treatment: <http://scuba-doc.com/sitemap.html>

Navy Diving Manual <http://www.supsalv.org/manuals/diveman5/divManual5.htm>

EMERGENCY MEDICINE

Emergency Medicine Reference: <http://www.aha.org/aha/issues/Emergency-Resources>

Resources for Emergency Department Operations Management:

http://www.acep.org/webportal/PracticeResources/issues/crowd/InformationPaperEmergencyDepartmentOperationsManagement.htm?wbc_purpose=Basic&WBCMODE=PresentationUnpublished%2cPresentationUnpublis

National Center for Emergency Medicine Informatics: <http://www.ncemi.org/>

Crowding and Surge Capacity References for the ED: http://www.acep.org/NR/rdonlyres/D9697FC7-2F71-4B92-A696-3E369A560023/0/Crowd_Surg_Cap_4_07.pdf

Pediatric Emergency Skills Retention (guide): <http://www.acep.org/NR/rdonlyres/1ED1E300-8D37-4A57-B65C-6E3FAF303CD8/0/PediatricCompendium.pdf>

Primary Trauma Care Foundation: <http://www.primarytraumacare.org/>

The Primary Trauma Care Manual: <http://www.steinergraphics.com/surgical/manual.html>

ENVIRONMENTS AND ENVIRONMENTAL MEDICINE

The Desert Doc. Tom Myers, MD. (Due in 2007).
Expeditions: The Expert's Way. John Blashford-Snell. Faber. 1977.
Expedition Medicine. Royal Geographical Society Staff. Profile Books Limited. 7th Edition. 2004.
High Altitude Medicine Handbook. Andrew J. Pollard. Radcliffe Medical Press. 2003.
Jungle Travel & Survival. John Walden. The Lyons Press. 2001.
Medicine for Mountaineering and Other Wilderness Activities. James A. Wilkerson. Mountaineers Books. 5th Edition. 2001.
Wilderness Medicine: Management of Wilderness and Environmental Emergencies. Paul Auerbach. Mosby. 4th Edition. 2001.
American Academy of Environmental Medicine: <http://www.aaem.com/>
Environmental Medicine Links: <http://www.uib.no/isf/guide/occu.htm>
International Society for Travel Medicine: <http://www.istm.org/>
Resources in Travel Medicine: <http://gorgas.dom.uab.edu/geomed/links2.html>
International Union for Circumpolar Health: <http://www.iuch.org/>
Desert Operations Guides: http://www.armystudyguide.com/content/army_board_study_guide_topics/desert_operations/index.shtml
Riverine Operations: <http://www.globalsecurity.org/military/library/policy/army/fm/55-50/Ch7.htm>
Royal Geographic Society Expedition Guides: <http://www.rgs.org/OurWork/Publications/Publications.htm>
Tropical Medicine Links: <http://hml.org/WWW/tropical.html>
Wilderness Medicine Links: <http://wms.org/links/interest.asp>
Journal of Wilderness and Environmental Medicine: <http://www.wemjournal.org/wmsonline/?request=index.html>

ENVIRONMENTAL HEALTH AND SANIATION

Basic Environmental Health. Annalee Yassi. Oxford University Press, USA. 2001.
Environmental Health: From Global to Local. Howard Frumkin, MD. Jossey-Bass 2005.
Low Cost Urban Sanitation. Duncan Mara. John Wiley. 1996.
Food-Borne Disease: A Focus for Health Education. World Health Organization. Geneva. 2000.
Guidelines for Drinking Water Quality. World Health Organization Geneva. 2nd Edition. 1998.
Water Resources: Health, Environment and Development. Brian H. Kay. Editor. E. & F.N. Spon. London. 1999.
Center for Health Promotion and Disease Prevention: <http://chppm-www.apgea.army.mil/>
Center for Health and the Global Environment: <http://chge.med.harvard.edu/>
National Institute of Environmental Health Science: <http://www.niehs.nih.gov/>
Environmental Health Topics: <http://www.niehs.nih.gov/health/topics/index.cfm>
Environmental Health in Emergencies: http://www.who.int/water_sanitation_health/hygiene/emergencies/en/
Environmental Health and Sanitation in Disasters: Field Sanitation Guide:
http://www.armystudyguide.com/content/army_board_study_guide_topics/field_sanitation/field-sanitation-study-gu.shtml
Water Sanitation and Health Resources: http://www.who.int/water_sanitation_health/resources/en/index.html

GERIATRICS

Essentials of Clinical Geriatrics. Robert L. Kane. McGraw-Hill. 5th Edition 2003.
Geriatrics At Your Fingertips. David B. Reuben. The American Geriatrics Society. 8th Edition. 2006.
Merck Manual of Geriatrics. Mark H. M.D. Beers (Editor). John Wiley. 3rd Edition. 2000.
American Geriatrics Association Links: <http://www.americangeriatrics.org/links/>
Geriatrics Practice: <http://www.fpnotebook.com/GER.htm>
Merck Manual of Geriatrics Online: <http://www.merck.com/mrkshared/mmg/contents.jsp>

IMPROVISED MEDICINE

Ditch Medicine: Advanced Field Procedures for Emergencies. Hugh L. Coffee. Paladin Press. 1993.
Do-It-Yourself Medicine. Ragnar Benson.. Paladin Press. 1997.
Medical Tests You Can Do Yourself. Herbert Haessler. Contemporary Books. 1997.
Survivalist Medicine Chest. Ragnar Benson. Paladin Press. 1982.
The Survival Nurse: Running an Emergency Nursing Station Under Adverse Conditions. Ragnar Benson. Paladin Press 2000.
Where There Is No Psychiatrist. Vikram Patel. Gaskell, Royal College of Psychiatrists. 2003.
Where Women Have No Doctor: A Health Guide for Women. Ronnie Lovich. Hesperian Foundation. 1997.
Where There is no Doctor: <http://www.healthwrights.org/books/WTINDonline.htm>
Where There is no Dentist: <http://www.healthwrights.org/books/WTINDentistonline.htm>
Where Women Have No Doctor: http://www.hesperian.org/publications_download.php#wwhnd
Midwives Handbook: http://www.hesperian.org/publications_download.php#midwives

INFECTIOUS DISEASES

Control of Communicable Diseases Manual. Heymann D. L. American Public Health Association, 18th Edition. 2004.
Emerging Infections. W. Michael Scheld. (Editor). ASM Press. 2006.
Infections and Inequalities: The Modern Plagues. Paul Farmer. University of California Press. 2001.
Infectious Disease Epidemiology. Kenrad E. Nelson, M.D. Aspen Publishers. 2006.
Principles and Practice of Infectious Diseases. Mandell. 6th Edition. Churchill Livingstone, 2004.
National Center for the Control of Infectious Diseases: <http://www.cdc.gov/ncpdcid/>
Center for Infectious Diseases Research: <http://www.cidrap.umn.edu>
Emerging Infectious Diseases Journal: <http://www.cdc.gov/ncidod/eid/index.htm>
Disease Surveillance: <http://www.bt.cdc.gov/episurveillance/>
Outbreaks and Surveillance: <http://www.who.int/csr/don/en>
Epidemic and Pandemic Alert: <http://www.who.int/csr/en/>
Epidemiology Online: <http://www.epbiostat.ucsf.edu/epidem/epidem.html>
Communicable Disease Control in Emergencies: http://whqlibdoc.who.int/publications/2005/9241546166_eng.pdf
Rare Diseases: <http://www.rarediseases.org>
Virology Online: <http://www.virology.net/garryfavwebindex.html>

INTERNATIONAL HEALTH

Critical Issues in Global Health. C. Everett Koop, MD (Editor). Jossey - Bass, 2002.
Cross Cultural Medicine. Judy Ann Bigby. (Editor). American College of Physicians. 2001.
Indigenous Customs in Childbirth and Child Care. Yvonne Lefebvre. Netherlands. 1998,
International Public Health: Diseases, Programs, Systems, and Policies. Michael H. Merson. Aspen Publishers. 2001.
Multicultural Medicine and Health Disparities. David Satcher. McGraw-Hill. 2005.
Textbook of International Health. Paul F. Basch. Oxford University Press, USA. 2nd Edition. 1999.
Cross Cultural Medicine Resources: <http://medicine.ucsf.edu/resources/guidelines/culture.html>
Ethnomedicine Resources: <http://www.ethnomed.org>/
Cross Cultural Medical Links: http://www.ethnomed.org/ethnomed/clin_topics/related.html
US Global Health Site: <http://www.globalhealth.gov>
Global Health Topics: <http://www.globalhealth.gov/topics/index.html>
Global Health Council Online Publications: <http://www.globalhealth.org/publications/>
Global Public Health References: <http://www.pbs.org/wgbh/rxfor survival/resources.html>

e-JOURNALS:

Medical Journals Online: [http://www.biomedcentral.com/](http://www.biomedcentral.com)
Medical and Science Journals for the Developing World: <http://www.biomedcentral.com/developingcountries>
Science and Medical Journals: <http://www.ispub.com/ostia/index.php?xmlFilePath=journals.xml>
Military Medical Technology: <http://www.military-medical-technology.com/>

LABORATORY AND PATHOLOGY

The Right Test: A Physician's Guide to Laboratory Medicine. Carl E. Speicher. Saunders. 3rd Edition. 1998.
Differential Diagnosis by Laboratory Medicine. Susan Mesko. (Editor). Springer. 2003.
Mosby's Manual of Diagnostic and Laboratory Tests. Kathleen Deska Pagana. Mosby. 2nd Edition. 2002.
Laboratory Links: <http://www.cdc.gov/nltn/mltl.aspx>
Clinical Lab Science Resources: <http://members.tripod.com/~LouCaru/index-5.html>
Armed Forces Institute of Pathology: <http://www.afip.org/>
Pathology Links: <http://members.tripod.com/Pathnet/links.htm>

MASS CASUALTIES

Mass Fatality and Casualty Incidents: A Field Guide. by Robert A. Jensen. CRC. 1999.
Mass Casualties and Events Response: <http://www.bt.cdc.gov/masscasualties/>
Weapons of Mass Casualties. (AAOS Monograph) Charles Stewart. Jones and Bartlett. 2005.
Hospitals for War Wounded: A Guide for Set-Up: <http://www.icrc.org/web/eng/siteeng0.nsf/html/p0714>
Interagency Emergency Health Kit Guidelines: <http://www.who.int/medicines/publications/en/>
Shelter Medical Services Primer: http://www.acep.org/webportal/PracticeResources/issues/disasters/_shelterprimer.htm?wbc_purpose=B
Surge Capacity in Bombings: <http://www.bt.cdc.gov/masscasualties/surgecapacity.asp>
Mass Casualty Resources: <http://www.bt.cdc.gov/masscasualties/>
Predicting Causality Severity and Hospital Capacity: <http://www.bt.cdc.gov/masscasualties/capacity.asp>

MEDIC RESOURCES

Critical Care Paramedic. Bryan E. Bledsoe. Prentice Hall. 2005.
EMS Field Guide: ALS Version. Paul Lesage. Informed Publishing. 15th Edition. 2005.
Emergency Care and Transportation of the Sick and Injured. Bruce D. Browner. Jones and Bartlett Publishers. 8th Edition. 2001.
Essentials of Paramedic Care. Bryan E. Bledsoe. Prentice Hall. 2nd Edition. 2006.
Hazardous Materials Injuries: A Handbook for Pre-Hospital Care. Douglas R. Stutz, Ph.D. Bradford Communications. 3rd Edition. 1992.
Pre-Hospital Care of the Elder Patient. Bruce M. Becker. Prentice Hall. 2003.
Pediatric Education for Prehospital Professionals. American Academy of Pediatrics. Jones and Bartlett. 2nd Edition. 2005.
The Streetmedic's Handbook. Owen T. Traynor. Thomson Delmar Learning. 2nd Edition. 2004.
International Committee for Military Medicine: <http://www.cimm-icmm.org/index.html>
NAEMT Special Operations Division: <http://www.naemt.org/divisionsAndCommittees/specialOperationsDivision/>
NAEMT Training: <http://www.naemt.org/educationalPrograms/>
JEMS Training Links: http://www.jems.com/education_and_training/index.html
National Paramedic Institute: <http://www1.emsjane.com/>
EMS Role in Disasters: <http://www.emsa.ca.gov/dms2/transformation.pdf>
First Aid in Armed Conflicts: <http://www.icrc.org/web/eng/siteeng0.nsf/html/p0870>
Journal of EMS: <http://www.jems.com/index.html>
SWATMEDIC Links: <http://www.swatmedic.org>
Diploma in Remote and Offshore Medicine (UK): http://www.health-informatics.info/diprom_modules.asp
Diver Medical Technician Training: <http://www.nbdhmt.com/dmt.html>
Pre Hospital Trauma Life Support: <http://www.naemt.org/PHTLS/>
International Trauma Life Support Course: <http://www.itrauma.org/>
Advanced Burn Life Support: <http://www.ameriburn.org/ablscoursedescriptions.php>
Advanced Hazmat Life Support: http://www.ahls.org/ahls/ecs/main/ahls_home.html
Advanced Medical Life Support: <http://www.naemt.org/AMLS/default.htm>
Advanced Wilderness Life Support: <http://awls.org/index.htm>
BiodefenseEd.org: <http://www.biodefenseeducation.org/>
Medicine in Challenging Environments: <http://www.trueresearch.org/mice2006/>
Biochemical Organic Radiological Disaster Educational Response System: <http://www.bordersalertandready.com/>
Bio-Terrorism and Emerging Infections: <http://www.bioterrorism.uab.edu>
Emergency Management Institute: <http://www.training.fema.gov/EMIWEB/>
Blast Injury Training: <http://www.bt.cdc.gov/masscasualties/tiidefacts.asp>
Center for Domestic Preparedness Courses: <http://cdp.dhs.gov/index.html>
Humanitarian University Consortium <http://www.humanitarian.net/university>
USMA Terrorism Training: <http://www.teachingterror.com/>
WMD Online Preparedness Education Program: <http://opep.usuhs.edu/>

MEDICAL IMAGING

Radiology Links & Resources: <http://www.radiologyeducation.com/>
MED PIX Medical Image Database: <http://rad.usuhs.edu/medpix/index.html>

MEDICAL INTELLIGENCE

Armed Forces Medical Intelligence Center: <http://www.afmic.detrick.army.mil/>
NATO MEDINT Course: http://www.ciomr.net/en/NATO_And_Related_Organizations

MENTAL HEALTH

Mental Health Resources: <http://www.bt.cdc.gov/mentalhealth/> and <http://www.mentalhealth.com/>
Disaster Mental Health Institute: <http://www.usd.edu/dmhi/>
National Mental Health Information Center: <http://mentalhealth.samhsa.gov/>
Emergency Mental Health: <http://mentalhealth.samhsa.gov/cmhs/EmergencyServices/>
Emotional Trauma Pages: <http://www.trauma-pages.com/>
Critical Incident Stress Management(CISM): <http://www.icisf.org/>
CISM Articles and Resources: <http://www.icisf.org/articles/>
American Academy of Stress Management: <http://www.aaets.org/>

MORTUARY AND FORENSIC SCIENCES

Identification of Pathological Conditions in Human Skeletal Remains. Donald J. Ortner. Academic Press. 2nd Edition. 2002.

Techniques of Crime Scene Investigation. 7th Edition. Barry A. J. Fisher. CRC. 7th Edition. 2003.
CDC Guidelines for Workers Who Handle Human Remains: <http://www.bt.cdc.gov/disasters/tsunamis/handleremains.asp>
Management of Human Remains: <http://www.icrc.org/web/eng/siteeng0.nsf/html/p0858>
Disaster Victim Identification Guide: <http://www.interpol.int/Public/DisasterVictim/guide/default.asp>
Mortuary Science: <http://healthweb.org/browse.cfm?subjectid=55>
National Association of Medical Examiners (Issues): <http://www.thename.org/>
Forensic Science: <http://www.ncjrs.gov/spotlight/forensic/Summary.html>
Forensic Investigation Links: <http://www.nlectc.org/links/forlinks.html>

OBSTETRICS AND GYNECOLOGY

Comprehensive Gynecology. (IV Edition). Morton A. Stenchever. Editor. Harcourt Health Sciences. 2001.
Current Obstetric and Gynecologic Diagnosis and Treatment. Alan H. DeCherney. McGraw-Hill. 9th Edition. 2002.
Obstetric and Gynecologic Emergencies: Diagnosis and Management. Mark D. Pearlman. McGraw-Hill. 2003.
Antenatal Guidelines or Crisis Conditions: <http://www.icrc.org/web/eng/siteeng0.nsf/html/p0875>
Reproductive Health Care in Emergencies: http://www.who.int/reproductive-health/pages_resources/listing_emergency.en.html

OPHTHALMOLOGY

Emergency Ophthalmology: A Rapid Treatment Guide. Kenneth C Chern. McGraw-Hill Professional. 2002.
American Academy of Ophthalmology: <http://www.aao.org/>
ACO Resources: <http://www.aao.org/international/index.cfm>
Eye Disorders Online: <http://www.merck.com/mmpe/sec09.html>
Ophthalmology Journal: <http://www.ophsource.org/periodicals/ophtha>

PALLIATIVE CARE

Hospice Guidelines and Toolkit: <http://www.mywhatever.com/cifwriter/content/22/files/sorostoolkitfinal120902.doc>
American Academy of Hospice and Palliative Medicine: <http://www.aahpm.org/>
Resource Guide: <http://www.aahpm.org/physresources/index.html>
Journal of Palliative Medicine: http://www.liebertpub.com/publication.aspx?pub_id=41

PEDIATRICS

Current Pediatric Diagnosis and Treatment. William W. Hay. McGraw-Hill. 17th Edition 2004
Handbook of Paediatrics in Developing Countries. Vincent C. Harrison. Editor. Oxford University Press. 6th Edition. 2004.
Merck Manual of Pediatric Therapeutics. John W Grae. Lippincott Williams.6th Edition. 1997.
Paediatrics and Child Health: A Manual for Health Professionals in the Third World. H.M. Coovadia, Oxford University Press. 5th Edition. 2003.
Organization, Geneva. 2005.
American Academy of Pediatrics: <http://www.aap.org/>
ACP Resources: <http://www.aap.org/profed.html>
Pediatric Immunization Guide: <http://aapredbook.aappublications.org/current.shtml>
Pediatric Patient Management: <http://practice.aap.org/topicBrowse.aspx?nodeID=4000>
Child Health and Development: <http://www.who.int/child-adolescent-health/publications/pubCNH.htm>
Child Health in Emergencies: <http://www.who.int/child-adolescent-health/publications/pubemergencies.htm>
Maternal/Child Health Resources: http://www.who.int/making_pregnancy_safer/publications/en/
Virtual Pediatric Hospital: <http://www.virtualpediatrichospital.org/>
Pediatrics Journal: <http://pediatrics.aappublications.org/>

PHARMACOLOGY

Basic and Clinical Pharmacology. Bertram G. Katzung. McGraw-Hill. 10th Edition. 2006.
Essential Psychopharmacology: Practical Applications. Stephen M. Stahl. Cambridge University Press. 2nd Edition. 2000.
Pre Hospital Emergency Pharmacology. Bryan E. Bledsoe. Prentice Hal. 6th Edition. 2004.
PDR Pocket Guide to Prescription Drugs. Thompson PDR. Thomas PDR Publishers. 7th Edition. 2005.
PDR for Nonprescription Drugs, Dietary Supplements and Herbs: The Definitive Guide to OTC Medications. Thomson PDR. Thomson PDR Publishers. 28th Edition. 2006.
American College of Clinical Pharmacology: <http://www.accp1.org/>
American Society of Psychopharmacology: <http://www.ascpp.org/>
International Society of Ethnopharmacology: <http://www.ethnopharmacology.org/>
Drug Information Online: <http://www.drugs.com/>
Orphan Drug Program: <http://www.orpha.net>

PDRs Online: <http://www.pdr.net/>

The Sanford Guide to Antimicrobial Therapy. David N. Gilbert. 34th Edition. 2004.

Tarascon Pocket Pharmacopoeia, 2006. Steven M. Green. Tarascon Publishers. 20th Edition. 2005.

Herbals: <http://www.botanical.com/botanical/mgmh/comindx.html>

Merck Clinical Pharmacology: <http://www.merck.com/mmpe/sec20.html>

WHO Essential Medicines, Medication and Formularies: <http://www.who.int/medicines/publications/en/>

Journal of Clinical Pharmacology: <http://jcp.sagepub.com/>

PRIMARY CARE

Current Practice Guidelines in Primary Care: 2006. Ralph Gonzales. McGraw-Hill. 6th Edition. 2005.

Current Medical Diagnosis and Treatment: 2007. Stephen J. McPhee. McGraw-Hill. 46th Edition. 2006.

The Merck Manual of Diagnosis and Therapy. Mark H. Beers. (Editor). Wiley. 2006.

American Academy of Family Physicians: <http://www.aafp.org/online/en/home.html>

AAFP Center for Health Information Technology: <http://www.centerforhit.org/>

AAFP Resources: <http://www.aafp.org/online/en/home/aboutus/relatedsites.html>

Policy Studies in Family and Primary Care Medicine: <http://www.graham-center.org/>

Medicine for People in Need: <http://www.medpin.org/>

Office of Rural Health Policy: <http://www.ruralhealth.hrsa.gov/>

Basic Medical Exam: http://www.brooksidepress.org/Products/OperationalMedicine/DATA/operationalmed_Exams/BasicExams.htm

Annals of Family Medicine: <http://www.annfammed.org/>

Journal of Emergency Primary Health Care: http://www.jephc.com/issue_contents.cfm?issue_id=30

e-PRACTICE AND PROTOCOL GUIDES (By Specialty)

<http://www.fpnotebook.com/> <http://www.emedicine.com/> <http://healthweb.org/>

<http://www.lib.uiowa.edu/hardin/md/> <http://www.medweb.emory.edu/MedWeb>

Medical Index Sites <http://www.lib.uiowa.edu/hardin/md/idx.html>

Medical and Health Sciences Libraries Online: <http://www.lib.uiowa.edu/hardin/hslibs.html>

PSYCHIATRY

Diagnostic and Statistical Manual of Mental Disorders: DSM-IV-TR. American Psychiatric Association. American Psychiatric Publishing. 4th edition.

Early Intervention for Trauma and Traumatic Loss. Brett T. Litz. The Guilford Press. 2003.

Handbook of Clinical Psychopharmacology For Therapists. John D. Preston. New Harbinger Publications. 4th Edition. 2004.

Kaplan & Sadock's Pocket Handbook of Clinical Psychiatry. Sadock and Kaplan. Lippincott, Williams & Wilkins. 3rd Edition. 2001.

Trauma and Recovery: The Aftermath of Violence from Domestic Abuse to Political Terror. Judith Herman. Basic Books. 1997.

Where There Is No Psychiatrist. Vikram Patel. Royal College of Psychiatrists. 2003.

American Psychiatric Association Resource Links: http://www.psych.org/public_info/resourcelinks.cfm

Diagnostic and Statistical Manual of Mental Disorders (DSM IV) Online: <http://allpsych.com/disorders/dsm.html>

Psychiatry Practice: <http://www.emedicine.com/med/PSYCHIATRY.htm> ; <http://www.lib.uiowa.edu/hardin/md/psych.html> and <http://www.fpnotebook.com/PSY.htm>

PUBLIC HEALTH

Case Studies in Emergency Medicine and Health of the Public. Edward Bernstein. (Editor). Jones and Bartlett. 1996.

Embodying Inequality: Epidemiologic Perspectives. Nancy Krieger (Editor). Baywood Publishing. 2004.

Health and Social Justice: Politics, Ideology and Inequity in the Distribution of Disease. Richard Hofrichter. (Editor). Jossey-Bass. 2003.

Managing Disaster Risk in Emerging Economies. Alcira Kreimer. World Bank. 2000.

Public Health Management of Disasters: The Practice Guide. Linda Y. Landesman. American Public Health Association. 2001.

Terrorism and Public Health: A Balanced Approach to Strengthening Systems and Protecting People. Barry S. Levy (Editor). Oxford University Press, USA. 2006.

American Public Health Association: <http://www.apha.org/>

American Public Health Association, Resources: <http://www.apha.org/programs/resources/>

Centers for Public Health Preparedness: http://www.asph.org/cphp/cphp_home.cfm

Public Health Emergency Countermeasures: <http://www.hhs.gov/aspr/ophemc/index.html>

Global Public Health: <http://www.globalhealth.org/>

Public Health Surveillance Toolkit:

<http://siteresources.worldbank.org/INTPH/Resources/376086-1133371165476/PHSurveillanceToolkit.pdf>

e-REFERENCES and e-TOOLS:

Questia Online Research, Books, Journals: <http://www.questia.com/Index.jsp>
Medical Student.com: <http://www.medicalstudent.com/>
Anatomy Atlases: <http://www.anatomyatlases.org/>
USUHS Learning Resource Center: <http://www.lrc.usuhs.mil/>
Military Medical Technology: <http://www.military-medical-technology.com>
Medical Algorithms: <http://www.medal.org/visitor/login.aspx>
Medical References: <http://www.medtrng.com/medicaloperations.htm>
Merck-Source Online Guide: <http://www.mercksource.com>
Medical Dictionary Online: <http://cancerweb.ncl.ac.uk/omd/>
National Center for Biotechnology Information: <http://www.ncbi.nlm.nih.gov/>
Relief Web Library: <http://www.reliefweb.int/rw/lib.nsf/doc205?OpenForm>
Virtual Medical Center: <http://www.martindalecenter.com/Medical.html>
GIS and Public Health: <http://www.cdc.gov/nchs/gis.htm>
Public Health Mapping and GIS: http://www.who.int/health_mapping/en/
Diagnostic Tests and Vaccines for Terrestrial Animals: http://www.oie.int/eng/normes/mmanual/A_summary.htm
Medical Threats Briefing (by Topic): <http://usachppm.apgea.army.mil/hiomtb/>

REFUGEE HEALTH

Management of Severe Malnutrition: A Manual for Physicians and Other Senior Health Workers. World Health Organization. Geneva. 1999.

Patronage or Partnership: Local Capacity Building in Humanitarian Crises. Jan Smillie Kumarian Press. 2001.

Refugee Health: An Approach to Emergency Situations. G. Hanquet. Editor. McMillan Education. London. 1997.

The Management of Nutrition in Major Emergencies. WHO: World Food Program. Geneva. 2000.

Famine Affected Refugees:

<http://www.brooksidepress.org/Products/OperationalMedicine/DATA/operationalmed/CDC/refugees/entire.htm>

Multi Service Humanitarian Assistance: <http://www.brooksidepress.org/Products/OperationalMedicine/DATA/operationalmed/Manuals/FM100-23-1/FM100231TableofContents.htm>

Refugee Handling: http://www.brooksidepress.org/Products/OperationalMedicine/DATA/operationalmed/Manuals/_HumanitarianAssistance/refugees/entire.htm

Refugee Medicine: <http://www.brooksidepress.org/Products/OperationalMedicine/DATA/operationalmed/CDC/refugees/entire.htm>

Nutrition in Emergencies: <http://www.who.int/topics/nutrition/publications/emergencies/en/>

Management of Severe Malnutrition: <http://whqlibdoc.who.int/hq/1999/a57361.pdf>

Post Conflict Reconstruction Project: <http://www.csis.org/isp/pcr/>

SEARCH AND RESCUE

Confined Space Rescue. Chase Sargent. Fire Engineering Books. 2000.

Technical Rescue Operations: Common Emergencies. Larry Collins. Fire Engineering Books. 2006.

Disaster Search and Urban Rescue: <http://www.disastercenter.com/search.htm>

Combat Search and Rescue Procedures: http://www.army.mil/usapa/epubs/pdf/r525_90.pdf and <http://www.au.af.mil/au/aul/school/sncoa/sandr.htm>

National Institute for Urban Search and Rescue: <http://www.niusr.org>

NIUSR Online Journal <http://www.niusrjournal.org/main.html>

Technical Rescue Resource Guide: <http://www.techrescue.org/>

Naval Search and Rescue Model Manager: <http://www.hsc3.navy.mil/sarmm/>

National Association for Search and Rescue: <http://www.aams.org/>

Search and Rescue Links: <http://www.nasar.org/nasar/links.php>

SURGERY

Surgery Guide: <http://www.steinergraphics.com/surgical/index.html>

Surgery for Victims of War: <http://www.icrc.org/web/eng/siteeng0.nsf/html/p0446>

War Wounds: Basic Surgical Management: <http://www.icrc.org/web/eng/siteeng0.nsf/html/p0570>

Best Practice Guidelines for Surgical Care in Emergencies: http://www.who.int/surgery/en/ESC_in_disasters.pdf

Surgical Care at the District Hospital: <http://www.who.int/surgery/publications/en/SCDH.pdf>

Integrated Management of Essential and Emergency Surgical Care: <http://www.who.int/surgery/publications/imeesc/en/index.html>

Essential Surgical Care: Toolkit: <http://www.steinergraphics.com/surgical/index.html>

TACTICAL EMS

Combat Medicine: Basic and Clinical Research in Military, Trauma, and Emergency Medicine. George C. Tsokos. (Editor). Humana Press. 2003.

Tactical Emergency Care: Military and Operational Out-of-Hospital Medicine. Robert A. De Lorenzo. Prentice Hall. 1999.

Tactical Medicine: An Introductory To Law Enforcement Emergency Care. Ian McDevitt Paladin Press. 2001.

Terrorism Handbook for Operational Responders, Armando S. Bevelacqua. Thomson Delmar Learning. 2nd Edition. 2003.

PHTLS Basic and Advanced Pre hospital Trauma Life Support: Military Version. National Association of Emergency Medical Technicians.

Centers for Tactical Medicine: <http://www.mcg.edu/ems/COM/> ; <http://www.gwemed.edu/opmed/tacmed.htm> ;
<http://www.mcg.edu/ems/COM/Tactical/> and <http://www.casualtycareresearchcenter.org/OPM%20Main%20Page.htm>

Journal of Tactical Emergency Medicine: <http://www.tems.org>

TELEMEDICINE

Handbook of Telemedicine. Olga Ferrer-Roca. IOS Press. 1999.

Essentials of Telemedicine and Telecare. A. C. Norris. John Wiley & Sons. 2002.

Telemedicine and Telehealth: Principles, Policies, Performance and Pitfalls. Adam William, MD. Springer Publishing Company. 2002.

U.S. Army Telemedicine: <http://www.tatrc.org/>

US HHS Telehealth: <http://www.hrsa.gov/telehealth/>

Telemedicine Resources: <http://tie.telemed.org/links/>

Telemedicine Links: <http://www.quasar.org/21698/textfodder/telelink.htm>

Center for Telehealth Law: <http://www.ctel.org/>

Journal of Telemedicine and Telecare:)

TROPICAL MEDICINE

Oxford Handbook of Tropical Medicine. Michael Eddleston. Oxford University Press, USA. 2nd Edition. 2004.

Rapid Infectious Diseases and Tropical Medicine. Rachel Isba. Blackwell Publishing Professional. 2003.

Sexually Transmitted Infections and AIDS in the Tropics. O. P. Arya. CABI Publishing. 1998.

Tropical Infectious Diseases: Principles, Pathogens & Practice. R.L. Guerrant. Churchill Livingstone. 1998.

American Society of Tropical Medicine: <http://www.astmh.org/>

Institute of Tropical Medicine: <http://lib.itg.be/bibhome.htm>

The International Registry of Tropical Imaging: <http://tmcr.usuhs.mil/toc.htm#>

Training in Tropical Diseases: <http://www.who.int/tdr/index.html>

Neglected Tropical Diseases Project: <http://tdrtargets.org/>

Military Tropical Medicine: <http://tmcr.usuhs.mil/>

Tropical Medicine Links: <http://www.astmh.org/links/index.cfm>

American Journal of Tropical Medicine and Hygiene: <http://www.ajtmh.org/>

VETERINARY MEDICINE

Animal Management in Disasters. Sebastian E. Heath. Mosby. 1999.

Merck Veterinary Manual. Cynthia M. Kahn. Editor. John Wiley & Sons 9th Edition. 2005.

Where There is no Animal Doctor. Peter Quesenberry. Christian Veterinary Mission. 2000.

American College of Veterinary Clinical Pharmacology: <http://www.acvcp.org/>

Advanced Veterinary Information System: <http://www.aviscollege.com/>

American College of Veterinary Emergency and Critical Care: <http://acvecc.org/>

World Veterinary Association: <http://www.worldvet.org/>

Biosecurity Resource Center for Animal Health Emergencies: <http://www.biosecuritycenter.org/>

Veterinary Environmental Health Center: <http://www.emc.ncsu.edu/>

Animal and Plant Health Inspection Service: http://www.aphis.usda.gov/about_aphis/

Animal Disease Notification Online: http://www.oie.int/eng/info/hebdo/A_INFO.HTM

Veterinary Public Health and Zoonoses: <http://www.who.int/zoonoses/vph/en/>

Global Early Warning System for Animal Diseases <http://www.who.int/zoonoses/outbreaks/glews/en/index.html>

World Organization for Animal Health: http://www.oie.int/eng/en_index.htm

Med Quiz

Picture This.....

Timothy McGraw, MD; Daniel Schissel, MD

While on a deployment in Afghanistan, a 28 year-old active duty male developed a 1 cm hemorrhagic bulla on the dorsal surface of his right third toe. The bulla was manipulated and drained with a sterile needle. Two days later, a 7mm lesion noted in **Figures 1** and **2** developed that bled easily when touched. The patient had no significant past medical history and no history of arthropod bites in the affected area.



Figure 1



Figure 2

Using the primary lesion definitions outlined in your SOF medical handbook, how would you describe the morphology of this lesion?

What is the differential diagnosis of this lesion?

Morphology

Upon inspection of his right foot, a solitary, well-circumscribed, glistening, red, frambesiform (raspberry-like), 7mm sessile papule covered with a yellow fibrinous membrane was noted on the dorsum of the right third toe just distal to the metatarso-phalangeal (MTP) joint. Surrounding erythema was also noted.

Differential Diagnosis

Pyogenic granuloma, bacillary angiomatosis, amelanotic melanoma, basal cell carcinoma, glomus tumor, Kaposi sarcoma.

Etiology & Pathophysiology of Pyogenic Granuloma

Pyogenic granulomas (PGs) are benign, rapidly growing, and sometimes painful vascular proliferations of the skin and mucous membranes. The term *pyogenic* suggests an infectious etiology, but the lesion is actually a collection of blood vessels which explains why the lesion typically bleeds even after the slightest trauma. PGs are common in children, but may occur at any age. Cutaneous PGs occur most often on the trunk, upper extremities, head, lower extremities, and neck while mucosal PGs occur most commonly in the oral cavity.¹ *Granuloma gravidarum* is the term used for a PG that develops on the gingiva and in other locations in pregnant women.^{2,3} Women taking oral contraceptives also may develop mucosal PGs.⁴ PGs are thought to occur at sites of previous trauma or burns. PGs are also referred to in the literature as lobular capillary hemangiomas.

Diagnosis of Pyogenic Granuloma

Definitive diagnosis requires histologic demonstration of a capillary hemangioma with lobules separated by connective tissue. A history of a rapidly growing somewhat painful lesion that bleeds easily when touched coupled with a typical solitary, well-circumscribed dome-shaped sessile (not on a stalk) or pedunculated (on a stalk) papule should raise suspicion for PG.

Important parts of the history to obtain:

How long has the lesion been present? If the lesion has been present longer than six weeks, consider a different diagnosis (such as amelanotic melanoma or other cutaneous malignancy).

Has the patient taken an oral retinoid (Accutane) recently for acne? PG-like lesions on the face and extremities have been reported after such therapy.

Is there any irregularity in pigment of the skin immediately adjacent to the lesion? Any irregular pigment surrounding the lesion could represent an amelanotic melanoma.⁵

Is the patient HIV-positive and/or immunocompromised? If so, the diagnoses of Kaposi sarcoma and bacillary angiomatosis should be entertained.

In those patients with a typical history and presentation, the diagnosis of PG is usually straightforward and one should confidently proceed with treatment (see below).

Treatment of Pyogenic Granuloma

There are a number of proposed treatments for PG to include silver nitrate application, liquid nitrogen cryotherapy, shave excision and/or curettage followed by electrofulguration or silver nitrate application, and excision or laser ablation for recalcitrant lesions.^{2,6-8} Weekly treatment with silver nitrate applicators or cryotherapy using one or two freeze-thaw cycles ensuring a 1 to 2mm freeze of normal tissue surrounding the lesion is the ini-

tial treatment recommended in some studies. PGs usually resolve within one month of silver nitrate application or within two months of cryotherapy.^{6,8} Shave excision after local anesthesia and/or curettage with a curette or a moistened gauze sponge is also another first-line treatment. Removal of the entire vascular lesion is essential, because even the slightest residual can lead to recurrence. For this reason, shave excision with curettage is recommended. If possible, the sample should be preserved for histopathological evaluation. Electrofulguration or silver nitrate application to the base of the lesion is necessary for hemostasis after excision and curettage.

Field Treatment of Pyogenic Granuloma

In the field, cryotherapy or silver nitrate application is the initial treatment for lesions less than 5mm. Since silver nitrate may cause tattooing, cosmetically sensitive areas such as the face are not good candidates for silver nitrate treatment. Patients should be advised of the possibility of tattooing prior to silver nitrate treatment in any location of the body.

If the lesions continue to increase in size, continue to bleed after one to two weeks, are larger than 5mm, interfere with mission completion, or become more painful, shave excision with curettage followed by silver nitrate application or electrofulguration (if available) is indicated. If electrofulguration is not available, a battery-operated cautery pen can be used. The site should be completely healed within two to three weeks after the procedure. Recurrences or incomplete healing should prompt consideration of another diagnosis and consultation with your preceptor.

Recommended Prevention of Pyogenic Granuloma

There are no proven strategies to prevent PG.



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LTC Daniel Schissel originated "Picture This" for the Med Quiz. He is a 1993 graduate of the Uniformed Service University of the Health Sciences and completed his internship with the family practice department at Fort Bragg in 1994. He then served as the 2/10th Special Forces Group (Airborne) Surgeon and followed on as the 10th SFG(A) Group Surgeon. He completed his residency training in dermatology at the Brooke Army Medical Center in 1999. LTC Schissel is presently stationed in Heidelberg, Germany as a staff physician and the European Regional Medical Command Dermatology Consultant. He has been selected as the U.S. Army OTSG Dermatology Consultant. LTC Schissel has authored the dermatology section of the new SOF manual, serves on the USSOCOM Medical Curriculum and Examinations Board, and is the U.S. Army Aviation Dermatology Consultant.

References

1. Harris MN, Desai R, Chuang T-Y, Hood AF, Mirowski, GW. (2000). Lobular capillary hemangiomas: An epidemiologic report with emphasis on cutaneous lesions. *Journal of the American Academy of Dermatology*; 42(6):1012-6.
2. James WD, Berger TG, Elston DM (Eds.). (2006). Cutaneous vascular abnormalities. In: *Andrew's Diseases of the Skin Clinical Dermatology*. Philadelphia: WB Saunders: 592.
3. Neville BW, Damm DD, Allen CM, Bouquot JE. (2002). Oral & maxillofacial pathology. 2nd ed, Philadelphia: WB Saunders: 437-95.
4. Jafarzadeh, H, Sanatkhani M, Mohtasham, N. (2006). Oral pyogenic granuloma: A review. *Journal of Oral Science*; 48(4):167-75.

5. Crowe MA, Steinberg B. Pyogenic Granuloma. Retrieved 30 September 2007 from <http://www.emedicine.com/ped/topic1244.htm>.
6. Quitkin HM, Rosenwasser MP, Strauch RJ. (2003). The efficacy of silver nitrate cauterization for pyogenic granuloma of the hand. *The Journal of Hand Surgery*; 28A (3): 435-8.
7. Ghodsi SZ, Raziei, M, Taheri A, Karami M, Mansoori P, Farnaghi F. (2006). Comparison of cryotherapy and curettage for the treatment of pyogenic granuloma: A randomized trial. *British Journal of Dermatology*; 154:671-5.
8. Mirshams M, Daneshpazhooh M, Mirshekari A, Taheri A, Mansoori P, Hekmat S. (2006). Cryotherapy in the treatment of pyogenic granuloma. *European Academy of Dermatology and Venereology*; 20: 788-90.

If you are DEPLOYED and have concerns about a puzzling skin condition, you can email your clinical photos and a concise morphologic description of the lesion to our Operational Teledermatology site at derm.consult@us.army.mil or directly to Daniel.Schissel@us.army.mil. The lesion you describe just may make its way to the next edition of **Picture This...**

Thanks for all you do.



SOCM GLENN MERCER

Introduction to the Fall Edition's Human Performance (HP) Forum

For the next two forum pieces we are presenting some emerging concepts from the conventional forces. I intend to present two documents that have been circulating in Marine Corps and Army concept development for the last year.

Presented first is the Functional Fitness Concept Document from the Marine Corps. This was released in November 2006 and as of this date has not been implemented as a wholesale change within the Corps. This working paper is approached from the line leadership perspective as it was released from their combat development staff section. This provides a unique opportunity to contrast the approaches and rationale for conditioning from dissimilar authors and agencies. Since we commissioned the forum last year we have not had the opportunity to present a perspective that's as culturally unique as this one. The authors and endorsing officer are Marines.

The Marine Corps process of combat development and concept development is not arbitrary. As I read and reviewed the fundamentals of this document I found not only similar descriptive language to core SOF documents, but a very articulate description of the demands on the force. The paragraph narrating "THE MILITARY PROBLEM" establishes a parallel line to our challenges and frustration with present military medical infrastructure. Ultimately, combat readiness is a problem that is the cognizance of line leadership; however they often expect us to be able to solve DNBI problems without being able to control the variables that cause the damage. This eventually results in a cyclic environment that keeps the human performance staffs in a mode of receivership.

The SOF HP programs that achieved radical success lifted off when we were able to influence the front end stressors, or at a minimum interject the movement patterns that were needed in the pre-habiliatory aspect. This only happened when HP programs merged objectives with those personnel responsible for mission essential training. This concept document narrates from the perspective of the advocate as opposed to the repair department. The nomenclature is mildly different from the SOF descriptors and those in use within the professional sports models (PSM). However, I believe a concept like "injury proofing" is common sense to the common man.

Of all the points made in this document the critical node in my opinion is the argument for designated and educated physical training instructors (PTIs). My experience with the SOF units that have these is that performance is generally higher and morbidity lower than those that don't have this structure in place. While this is a very general statement, you will find that this role exists doctrinally in almost every professional athletic or tactical athletic organization other than the U.S. military.

My thanks to all the readers who have called or mailed in responding to the last two forums. This edition is a direct response to those queries and comments. I want to encourage every reader to submit feedback if they feel a topic is worth the time. I intend and desire to do mail responses every second issue of the JSOM. Keep them coming.

A Concept for Functional Fitness



UNITED STATES MARINE CORPS
Commanding General, Marine Corps Combat Development Command
Deputy Commandant for Combat Development and Integration

30 Oct 2006

A Concept for Functional Fitness

The Marine Corps is reaffirming today in combat operations that it is a premier fighting force — an organization of dedicated professionals whose warrior ethos and ability to rapidly adapt to challenging environments is second to none. Combat operations are teaching us a lesson about the individual Marine, a lesson we already knew, but are coming to understand better, and this is that our best investment as a service is in our people. The process of developing the Marine Corps of tomorrow begins with a vision — a concept that speaks to a way ahead. Some of the environmental challenges of combat operations in Afghanistan and Iraq reinforce the need to ensure that our Marines, of all military occupational specialties, are as well prepared physically as we can possibly make them. In recent decades, we have not maintained our focus on combat when we designed our physical fitness programs. Our physical training was not “functional” in this sense. This concept is a new kind of concept in that it is not focused on an organizational materiel capability, but rather on preparing Marines for the tough physical challenges they will inevitably face in combat and in peacetime training. *Functional Fitness* describes a new approach to physical training that, once implemented, will result in a major change in the way Marines view exercise and how units build training programs to prepare their people for combat.

James F. Amos
Lieutenant General
Deputy Commandant for Combat Development and Integration

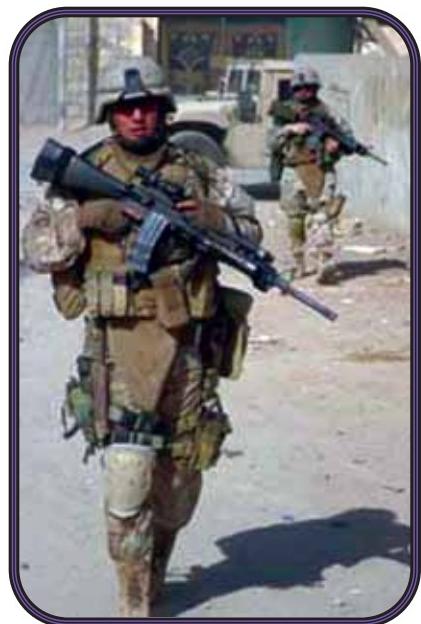
A Concept for Functional Fitness

The United States Marine Corps has for many years taken pride in the level of physical fitness of its members. Physical fitness has been associated with professional performance, especially performance in combat. This association is correct because combat is the factor that should matter most to a fighting organization. However, the Marine Corps' physical fitness program, as it is currently focused and structured, does not adequately prepare Marines for combat. In fact, other than the inherent ingenuity that some forward-thinking commanders evidence, the focus of the program seems to have only a mediocre combat focus at best. Further, most units find it difficult to follow the program as it stands, but even if the units did, they would still find that their people were insufficiently prepared for the physical rigors of combat.

Marines are athletes. Their preparation for combat is not unlike a collegiate or professional athlete's preparation for their sport. There are some key differences of course. Marines do not know the exact game they will be playing and they do not know the climate for the game. They do not know the rules. Marines do not even know when they will be "playing." However, these factors only make preparation more difficult for combat as compared to preparing for a season of sports. Many of the unknown (and unknowable) factors reinforce an argument that Marines need a general purpose sort of fitness — a fitness that is based on the functions of combat operations.

Participation in combat operations should cause the Marine Corps to examine all aspects of the organization for continued relevance. Recent combat operations have

highlighted the need to pay particular attention to our fitness program. Marines are being required to wear body armor and combat equipment an even greater percentage of the time. The mean weight of that body armor has increased, especially with the addition of the SAPI plates. The helmet puts an unnatural load on the neck and the flak jacket puts a load on the lower



back specifically and on the entire body generally. These facts are not going to change anytime soon. Additionally, extreme climates often require Marines to wear this organizational equipment in 120+ degree heat while performing physical tasks that would be tough, even in the most temperate climates. These, and other environmental factors, only serve to exacerbate the super-human demands (physical stress) that combat will place on a Marine's body.

When a Marine is injured in training, the Marine usually misses subsequent training — and his or her level of fitness declines. When a Marine is injured in combat, depending on the nature of the injury, he or she may spend months (or years) recovering. Physical therapy plays an important role in recovery. However, physical therapy without an integrated physical training program will not be optimized.

THE MILITARY PROBLEM

Physical preparedness is a job requirement (enabler) for Marines. Unfortunately, the Marine Corps' current physical fitness program may not meet the needs of the organization. Current orders and doctrine may not optimally support a complete fitness program that follows combat function. The program over-emphasizes aerobic training (long distance running) and gives very little attention to strength training. Combat demands a fitness that follows function, based on core strength and total body stamina. An unsophisticated exercise routine based almost entirely on mono-structural metabolic conditioning cannot provide the sort of training stimulus necessary to build general physical preparedness (GPP). Further, the current program, unlike sports programs, places little attention on "injury-proofing" Marines or on training around an injury during "active recovery."¹

CENTRAL IDEA

Marines, as combat athletes, need a comprehensive fitness program that will develop the physical skills necessary for combat; including core strength, endurance, speed, and coordination. The Marine athlete should be prepared for the physical challenges of combat with a program that develops both GPP and specific physical preparedness² — a program that integrates strength training based on functional, compound movements with multi-disciplinary speed, agility, and endurance training. The program should be intense and infinitely varied. The program must also be interesting — we want Marines to stick with it.

FITNESS

Physical fitness is oriented on an ability to perform physical work. Combat poses an infinite variety of physical tasks, many of which are foreseeable, some of which are not. This varied nature of physical requirements and the fact that some aspects defy predictability, place any preparation effort that is overly specialized at risk of irrelevance. Stated differently, the physical demands of real life — and combat operations in particular — support the argument that a preparation effort should promote a strong foundation of general fitness based on function.

FUNCTIONAL FITNESS DEFINED

Functional fitness can be described as the ability to perform a broad array of natural or realistic physical work. For Marines, that work involves all the tasks associated with performance in combat. The demands on the Marine's body will vary with load and duration (factors of intensity). A physical fitness that enables Marines to perform maximal combat-related work would be ideal. In this sense, we are arguing that fitness should follow function — that combat fitness should be functional for combat. A preparation effort in which a program based on functional movements executed with representative intensity of combat should be most effective.

"Functional exercise" involves multiple planes and multiple joints. Most human action (work) seems to involve a relatively limited number of fundamental movements (such as lifting, pushing, pulling, throwing, and locomotion). However, many exercise routines (especially weight training or body building as it is popularly practiced) follow a "reductionist" approach that strives to deconstruct a movement in order to apply focused stress on a singular joint and muscle group. Unfortunately, the human body does not work that way. The body works together as a system and exercises that serve to de-construct what are essentially irreducible (though admittedly complex) movements, can create imbalance, unnatural stress on muscles and joints, do not generate an ideal adaptive

response, and most importantly do not mimic the reality that the Marine athlete will experience. "The key to functional exercise is integration. It's about teaching all the muscles to work together rather than isolating them to work independently."³

GENERAL PHYSICAL PREPAREDNESS

GPP is a preparatory phase of training that, "... is intended to provide balanced physical conditioning in endurance, strength, speed, flexibility and other basic factors of fitness..." GPP exercises should involve as many muscle groups as possible. Therefore, the cardiovascular demand will be greater and the performance of more muscle groups will increase.⁴ GPP involves the formation, strengthening, or restoration of physical skills which enable athletic or sports performance.⁵



IMPORTANT ELEMENTS OF MARINE FUNCTIONAL FITNESS

Fitness should follow combat function. A functional fitness program must be balanced in approach so that the Marine athlete develops power, strength, flexibility, speed, endurance, agility, and coordination.



A functional fitness program must have intensity and great variety. It is characteristically general and balanced. The intensity leads to positive physical adaptation and the variety keeps the stimulus fresh and helps avoid over-training related injuries. Repetitive exer-

cise routines can actually serve to limit motion and stimulus and this limitation can lead to dysfunction and injury.⁶ The great variety also helps to keep the training interesting for Marines.

A functional fitness program must be *scalable*, allowing for the range of fitness levels of various unit members. This scalability is an acknowledgement that Marines will have different starting points in their personal fitness level and also allows the individual Marine to progress at his or her own pace. The program itself must be deliberately *progressive*, working to improve physical skills and advance the Marine athlete's physical condition.

Emphasis must be placed on making Marines "injury proof." That is, by strengthening the muscles and joints and increasing bone density (another physical adaptation to exercise), Marines are less likely to sustain a debilitating injury resulting from physical stress—either in training or once deployed. The functional fitness program, in this sense, focuses on "*prehabilitation*"⁷ rather than waiting for an injury to actually occur and thereby having to resort to rehabilitation. Likewise, a functional fitness program must have an educational aspect in which Marines are taught efficient biomechanics for functional movements like running, lifting, jumping, and landing. The use of efficient biomechanics in movement serves to reduce the incidence of injury and make the athlete faster and more agile. Essentially, the athlete is instructed on how to become a more efficient machine—a machine that can perform optimally in the rigors of combat with less likelihood of injury.⁸

When a Marine is injured through physical stress, he or she is more likely to recover more rapidly if the body has been exposed to functional fitness exercise.⁹ Moreover, being injured is not a time to relax. A functional fitness program will seek to minimize the period a Marine athlete spends in *passive recovery*¹⁰ and rapidly transition into some sort of *active recovery*. Marines can work around most injuries and continue training in a somewhat modified manner. In fact, the period of recovery from injury should be an opportunity to learn a new physical skill and become stronger in a new area. The body will tend to heal faster and the Marine will be stronger in the long run.

When a Marine is injured in combat, he or she may face a daunting task of rehabilitation. Ideally, we want the Marine to be able to return to duty. However, even if that is not possible, we want to restore the Marine to the optimal level of physical functionality that he or she can achieve. Physical therapy and physical fitness can work almost seamlessly here to speed recovery. A Marine functional fitness program must include this role in rehabilitation of injured warriors.

The link in humans between the physiological and the psychological realms has been well established in science and medicine. This link has particular relevance to the development and preparation of Marines for battle. Combat stress is both physical and mental—and very real. Marines can sustain both physical and mental injuries in combat. Rigorous exercise can prepare Marines for these forms of battlefield stress by making them physically and mentally tougher. The stress of functional fitness can elicit both physiological and psychological adaptation. The principle here is that body can be conditioned to better handle combat stress. A functional fitness program can play an important role in this pre-combat conditioning by applying a "combat-like" form of stress on the human system—using rigorous exercise that mimics or mirrors combat function.

The functional fitness program is the commander's program. The program must be flexible—adaptive to individual and unit requirements. The program must acknowledge the need both for base fitness (GPP) and occupational or mission specific training. A commander will adapt his program to integrate training based on the mission and operating environment as he knows more about these. For instance, an infantry battalion commander who knows he will be deploying to a mountainous area (such as Afghanistan) will elect to place more emphasis on developing the physical skills related to this mission. Coaches do something similar with off-season training that prepares the athletes to make a smooth transition into pre-season and in-season training. Of course, Marines have no off-season, but sometimes commanders will have advance notice of their mission specific challenges and will plan accordingly.

WHAT IS NEW?

In the past couple decades there have been many advancements in the fields of kinesiology (study of movement), exercise science, sports training and athlete development, and physical therapy. There have been fairly recent improvements in the understanding of human physiology—most of this emanating from college and professional sports. As sports teams look for ways to improve their athletes' performance, "new" techniques are discovered for improving individual human performance more generally. While the importance of core strength and stability is not new, the emphasis is rather new. Sports as seemingly diverse as football, volleyball, and basketball are all seeing the advantages of developing core strength and stability through functional, compound movement exercises. We know that strength originates from the core and extends to the extremities. Stability of the core provides the solid foundation that is essential for athletic



movement, especially dynamic non-linear movement.

What does this mean for Marines preparing for combat? Marines will be called upon to conduct forced marches and patrols with heavy gear. They will have to cross obstacles of many types, especially in urban environments. Marines do a great deal of lifting, pulling, throwing, and movement. In other words, they execute basic functional movements, and they do it under the most extreme circumstances — including being under fire. It is not an overstatement to say that a Marine's life may revolve around his or her ability to move his weight — and maybe the weight of another Marine — around the battlefield. Conversely, though endurance is critically important for a Marine's fitness, experience in recent combat operations has reinforced the idea that short, fast runs, normally under heavy load, are more the norm than long, endurance-type runs. Marines in combat service support are also called upon to work in rigorous situations in which core strength is an enabling capability. This principle applies to all Marines.

WHAT ABOUT THE PFT?

The current Marine Corps physical fitness test (PFT) is aimed at giving individuals and units an indication of their respective level of physical fitness. As stated in the Marine Corps Order, Marines are in no way encouraged to train for the test, but rather to let the test demonstrate their current physical state. If a Marine trains specifically and singularly for the test, his or her physical fitness will likely be unbalanced because the exercises that are part of the PFT do not by themselves develop functional fitness. A Marine could score well on a PFT and strain his or her back while lifting a pack or carrying a 155mm projectile to the loading tray. The problem here is not with the PFT, but with the training. A functional fitness program will have other tests as well as the PFT. Individual Marines and groups of Marines will

"test" themselves regularly during the course of their workouts. Commanders will develop physical training that stresses their unit members to the point that genuine and meaningful evaluation is possible. In the same manner that the known distance (KD) course establishes a baseline of proficiency, commanders will continue to use the PFT to assess baseline physical fitness — and then they will press on with more advanced and mission-focused training and assessment. In this, commanders will be developing their own mission-focused test(s) and using these for the purpose of learning how effective their functional fitness program is.

IMPLICATIONS FOR COMBAT DEVELOPMENT

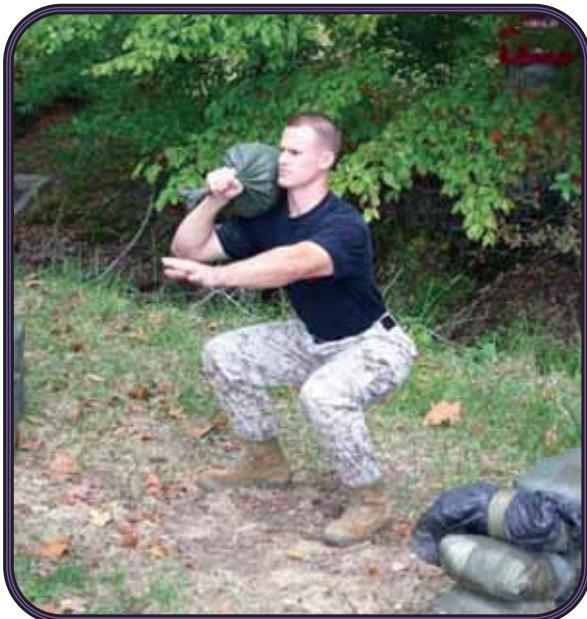
In order for a Functional Fitness Program to be of utility — to really support the needs of commanders and their Marines — it must *fit* the culture and organizational limitations of the Marine Corps. The philosophy and essence must be easily understandable, especially to Marine leaders who will be responsible for the program's ultimate implementation, and for integrating the elements of the program into unit training. Commanders are always faced with time constraints, so the functional fitness program must absorb no more time than the current program. The functional fitness program must be so practical, that commanders can, with a little creativity, integrate elements into other training events as well. Some commanders may incorporate combat fitness into their command philosophy. Likewise, units always face budgetary realities which limit them to the purchase of mission essential equipment. A new fitness program must be affordable.

Marines should be introduced to Functional Fitness during entry level training and all follow-on training and education should include greater exposure to this practical, real-life form of fitness training. NCOs, SNCOs, and young officers should gain sufficient proficiency in functional fitness so that they are able to lead group and unit training and to manage program development for their sections and platoons. Commanders should designate a fitness coordinator for their units and these coordinators (probably an experienced NCO or SNCO) will need to receive specialized training in the functional fitness program.

In a logical application of the "train the trainer" concept, there will need to be some initial centralization of the program — probably at Quantico. In concept, trainers who receive more extensive instructor trainer certification will need to travel out to bases and installations to teach and certify unit trainers. Major subordi-



nate commands (such as division schools) may provide an ideal venue and structure for functional fitness trainers who can then in turn teach unit coordinators down to at least the battalion/squadron level and thereby perpetuate the program. This concept of training trainers is not without precedent in that it is much akin to the Marine Corps martial arts program (MCMAP). Similarly, the British Royal Marines have a system of unit physical training instructors (PTI) that coordinate unit physical training and advise their unit commanders on physical training. Of note, these seasoned NCOs have other primary jobs within their units. The PTI is an additional competency and responsibility.¹¹ Unit fitness coordinators, in the same fashion as the Royal Marine PTI, could develop and manage a unit program based on mission guidance from his or her commander. The fitness coordinator is the commander's principal advisor on function fitness and should be well-schooled on



how to "customize" the unit's program to prepare for anticipated combat requirements as a unit ramps up for anticipated deployment. Additionally, unit fitness coordinators should be able to teach Marines correct movement mechanics; therefore, these coordinators must be instructed themselves in proper technique.

WHAT ABOUT FACILITIES AND EQUIPMENT?

The functional fitness program, as envisioned, does not require a great deal of sophisticated equipment. Most of the exercises can be conducted with basic weight equipment such as barbells, dumbbells, and medicine balls, chin-up and dip bars, jump ropes, boxes for box jumps, and some "cardio" equipment such as rowers and bikes. Running remains an important part of the program — but does not require equipment anyway. In fact, it should ideally require the acquisition only of a limited amount of basic, multi-use fitness equipment. Most of the movements associated with the functional fitness program, since they imitate combat function, can be performed with a filled sandbag, a rock, a filled five-gallon water jug, a tire, or an ammo can filled with sand. Once unit leaders understand the philosophy of the program and they become creative, they will find all sorts of "equipment" available to them. The whole argument about necessary equipment was recently strengthened by an experiment conducted by the Canadian School of Infantry who conducted a program similar to the one described in this concept using "austere" equipment. In this experiment, they used ammo cans of various sizes filled with sand, large rocks, sand bags, and water jugs filled with water. The results they obtained indicated convincingly that a quality functional fitness program can be conducted using materials at hand in any unit in any conceivable location.¹² Marines will be deploying on lengthy combat tours and must maintain their fitness while in combat. Marines can easily continue the functional fitness program, even in austere combat environments, and this fact makes the program particularly useful and practical.

SUMMARY¹³

Now, after several years of participation in intense combat operations, is a good time to re-examine the Marine Corps physical fitness program with an eye to revamp it to meet the emerging needs of the organization. This re-invigorated focus on combat-oriented fitness will certainly be energized by Marines of all grades who have recently participated in combat operations and who sense a need to make their training more relevant for what they experienced. The effort will not be without difficulty as change is never easy. This functional fitness program will be, for many Marines, significantly more challenging than any-

thing they have previously experienced. Although the average time expended is equal to or less than what many Marines are already accustomed to, the intensity and nature, being sufficiently stress-

ful to cause adaptation, will seem initially intimidating to many. However, the program, properly administered, will achieve the kind of results Marines need in order to optimally perform in combat. The key components of functional movement exercises of infinite variety, executed with intensity, will lead to the core strength, system endurance, speed and coordination that best enables combat effectiveness. As with any new initiative, there will be “costs” associated, but the results will speak for themselves — on the battlefield.



Glossary of Terms

Endurance — the ability to sustain a prolonged stressful effort or activity

Strength — the ability to generate or apply force. Strength in the athletic sense that Marines are concerned with, is a learned skill, requiring the development of muscle coordination—involving a complex interaction of muscles that contract and relax in cooperative, but opposite actions.¹⁴

Power — related to strength in that it is measured in terms of force over time. It is the rate at which work is performed.

Speed — the swiftness or rate of performance or action or the ability to perform a movement in as short a time as possible

Coordination — the harmonious functioning of muscles or groups of muscles in the execution of movements

Agility — ability to move the body quickly and easily or to transition from one movement to another

Aerobic training — “with oxygen”—physical work performed at a level of intensity that the metabolic system can keep up with the demand. Most “cardio” condition-

ing such as long distance running, swimming, cycling, and road marches fall in this category.

Anaerobic training — “without oxygen”—physical work performed at a level of intensity that exceeds the metabolic capacity of the body, placing the body in oxygen debt. High intensity training such as sprinting, weight lifting and many sports involve activities which fall in this category.

Compound movements — “... multi-joint movements consisting of two or more joints moving and therefore many muscles are involved. One example is the dumbbell bench press. In this exercise you are moving at the shoulders, elbows, and wrists. You are utilizing the muscles of the chest, shoulders, triceps, and a number of other muscles (i.e. synergists, stabilizers, antagonists, neutralizers, fixators) to complete the movement.”¹⁵

Scalability — principle of taking a “standard” workout and making it more or less intense in order to be appropriate for a wider audience of participants.

Progressive exercise — concept that acknowledges the human body’s improved physical condition as a result of adaptation to physical stimuli. To maintain the positive adaptive stimuli, the exercise must be varied, particularly in terms of increasing intensity.

Flexibility — is the ability of your muscles, tendons and ligaments to stretch which allow your joints to have a larger range of movement. This component is important to avoid injuries during physical activities.¹⁶ Of equal significance to athletes, flexibility allows the body to move through a greater range of motion with less internal resistance. This aspect is particularly important for athletes in developing optimal speed, agility, and efficient athletic function. Flexibility can be improved through various forms of static and dynamic stretching. *Static or passive stretching* involves holding a position. That is, the athlete stretches to their farthest point and holds the stretch. In contrast, *dynamic stretching* involves deliberately moving the body through a full range of motion—usually during a warm-up session. To be effective, flexibility training should be conducted on a regular basis and should be incorporated into the exercise routine.

REFERENCES

1. *Injury-proofing* is a term to describe efforts to reduce the Marine’s risk of movement-related injury in training or in combat. *Active recovery* involves recuperation from intense exercise, over training, or even injuries using low intensity exercises to increase healthy circulation, reduce the muscle soreness associated with lactic acid build-up in the muscles and to maintain fitness. Active recovery can also aid psychologically in the healing process as the Marine athlete benefits from taking positive steps toward a restored physical condition.

2. Specific Physical Preparedness (SPP) emphasizes exercises that prepare the athlete for the challenges unique to a particular activity. In this, the commander prepares the Marine athlete for his or her unique mission or occupational specialty.
3. Gina Shaw, *Working Out for Real Life Functions* <http://www.webmd.com/content/article/72/81694.htm>
4. Chad Waterbury, *Increase General Physical Preparedness*, Dragondoor.com, Quote of Dr. Mel Siff.
5. Bryan Mann, *General Physical Preparedness: The missing link in strength training*, EliteFTS.com
6. Pete Egoscue, *Pain Free, a Revolutionary Method for Stopping Chronic Pain*, (1998, New York, Bantam Books), p. 273-274.
7. Prehabilitation is a sports training term that acknowledges the role of injury prevention measures incorporated into athletic training.
8. This admonition is based on an October 2006 interview with Walt Cline, M.S., C.S.C.S., U.S.A.W., Director of Athletic Development for *Velocity Sports Performance*, Alexandria, VA.
9. William J. Kremer and Keijo Hakkinnen, *Strength Training for Sport*, (2002 London, Blackwell Science, Ltd.), p.43.
10. *Passive recovery* or rest recovery involves the Marine athlete re-fraining from physical activity to allow healing to occur. While this type of recuperation is important, current studies indicate that the period should be judiciously minimized. The body is “designed to move” and movement stimulates recovery.
11. This information is based on an interview conducted by the author with Color Sergeant Chris Richards of the Royal Marines in July 2006.
12. Reference to the Crossfit experiment conducted in the spring of 2006 by the Canadian School of Infantry
13. Special thanks to Coach Gregg Glassman and his Crossfit organization. Coach Glassman was instrumental in the development of the principles of this concept. There are many authorities who are now advocating the functional fitness method, but Coach Glassman’s Crossfit organization is probably the best single source representation of the ideas in this concept. Many Marines are already trying his method and realizing results. For more information on Crossfit, go to www.crossfit.com.
14. Kremer and Hakkinen, Strength Training for Sport, p.11.
15. George Stavrou, *Back to the Basics: Big Movements for Better Results!* <http://www.intensefitness.co.uk/training01.html>
16. Wikipedia encyclopedia

Dedication



SGT Timothy P. Padgett

SGT Timothy P. Padgett, 28, was killed in a fierce firefight in Afghanistan on 8 May 2007. SGT Padgett was a Special Forces medical sergeant (18D) assigned to 7th Special Forces Group (Airborne). He was on patrol when his unit was attacked.

U.S. officials said Taliban fighters fired guns, rocket-propelled grenades, and mortars at the Special Forces team and Afghan soldiers on patrol 15 miles north of Sangin. The town is in the heart of Afghanistan's biggest opium poppy region and has been the site of heavy fighting in recent weeks.

SGT Padgett died from wounds received during the firefight, according to the Army. He was born in Geneva, AL, but was raised in DeFuniak Springs, FL. He graduated in 1997 from Walton High School and was a former South Walton Fire District firefighter and paramedic.

SGT Padgett enlisted with the Army in 2003 as a Special Forces recruit. He completed the Special Forces Qualification Course in 2006 and was assigned to 7th Special Forces Group.

He deployed to Afghanistan in March.

His awards and decorations include the Good Conduct Medal, National Defense Service Medal, Global War on Terrorism Expeditionary Medal, Global War on Terrorism Service Medal, NCO Professional Development Ribbon, Army Service Ribbon, Parachutist Badge, Special Operations Dive Badge, and the Special Forces Tab.

Padgett is survived by his daughter, parents, sister, and brother.

Taps

CMSGT Robert L. Holler, PJ

Chief Master Sergeant Robert L. Holler retired as the Chief Enlisted Manager at the 38th Rescue Squadron, Moody AFB, Georgia. Chief Holler graduated as a PJ in July 1975. During his AF career he has had assignments at Nakom Phanom, Thailand; Clark AB, Philippines; McClellan AFB California; Kadena AB, Japan; Eglin AFB, Florida; Hurlburt Field, Florida. As a PJ Chief Holler has been credited with over 500 lives saved.

As part of the P. O. P. (Parachutists over Phorty) attempting to break the large formation record for Georgia on 17 March 2007, he collided with another jumper, a Special Ops Combat Controller named Danny Page. Both canopies collapsed and they plummeted 150 feet to the pavement below. Danny was killed on impact; Bob survived impact with the pavement but his injuries were so extensive, immediate life saving efforts could not save him. He was given CPR within 30 seconds of his impact by an 18D, SFC Scott Campos, until the ambulance arrived.

Chief Holler was an avid skydiver with over 4700 freefalls and was a member of World Team '99 and '04. The World Team is a collection of expert skydivers from over 30 different nations who, in 1999, as one team, set the large-formation skydiving world record of 282 and in February of this year, set the current large formation skydiving record of 357. Danny was the United States Parachute Association Safety Counsel President and had 7000+ jumps.

Chief Holler's military decorations include the Bronze Star with one oak leaf cluster, the Meritorious Service Medal with five oak leaf clusters, the Air Medal, the Aerial Achievement Medal, the Air Force Commendation Medal with three oak leaf clusters, the Air Force Achievement Medal and the Outstanding Unit Award with Valor Device and eight oak leaf clusters. His other achievements include Distinguished Graduate, Academic Achievement, and Drill Master awards from the NCO Academy.



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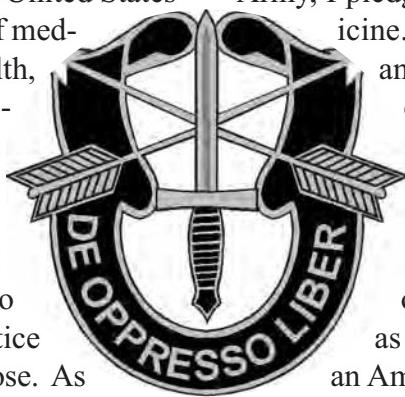
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Special Forces Aidman's Pledge

As a Special Forces Aidman of the United States Army, I pledge my honor and my conscience to the service of my country and the art of medicine. I recognize the responsibility which may be placed upon me for the health, and even lives, of others. I confess the limitation of my skill and knowledge. I promise to follow the maxim "Primum non- nocere" ("First, and even lives, of others. I confess the edge in the caring for the sick and injure. I will treat as secret. I recognize the responsibility which thou shalt do no harm"), and to medical authority whenever it is available. These confidences which come to me in my attendance on the sick, I will treat as secret. I recognize such knowledge of its art and practice others who seek the service of medicine as I possess, and I resolve to continue to improve my capability to this purpose. As an American Soldier, I have determined ultimately to place above all considerations of self the mission of my team and the cause of my nation.



Pararescue Creed

I was that which others did not want to be. I went where others feared to go, and did what others failed to do. I asked nothing from those who gave nothing, And reluctantly accepted the thought of eternal loneliness ... should I fail. I have seen the face of terror; felt the stinging cold of fear, and enjoyed the sweet taste of a moment's love. I have cried, pained and hoped...but most of all, I have lived times others would say best forgot- ten. Always I will be able to say, that I was proud of what I was: a PJ It is my duty as a Pararescueman to save a life and to aid the injured. I will perform my assigned duties quickly and efficiently, placing these duties before personal desires and comforts.



These things I do,
"That Others May Live."

A Navy Poem

I'm the one called "Doc"... I shall not walk in your footsteps, but I will walk by your side. I shall not walk in your image, I've earned my own title of pride. We've an- swered the call together, on sea and foreign land. When the cry for help was given, I've been there right at hand. Whether I am on the ocean or in the jungle wear- ing greens, Giving aid to my fellow man, be it Sailors or Marines. So the next time you see a Corpsman think of the job he's doing as those before him did. And if you ever have to go out there and your life is on the block, Look at the one right next to you...



I'm the one called "Doc".

- Harry D. Penny, Jr. USN Copyright 1975



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